

# EARTH COMPACTION

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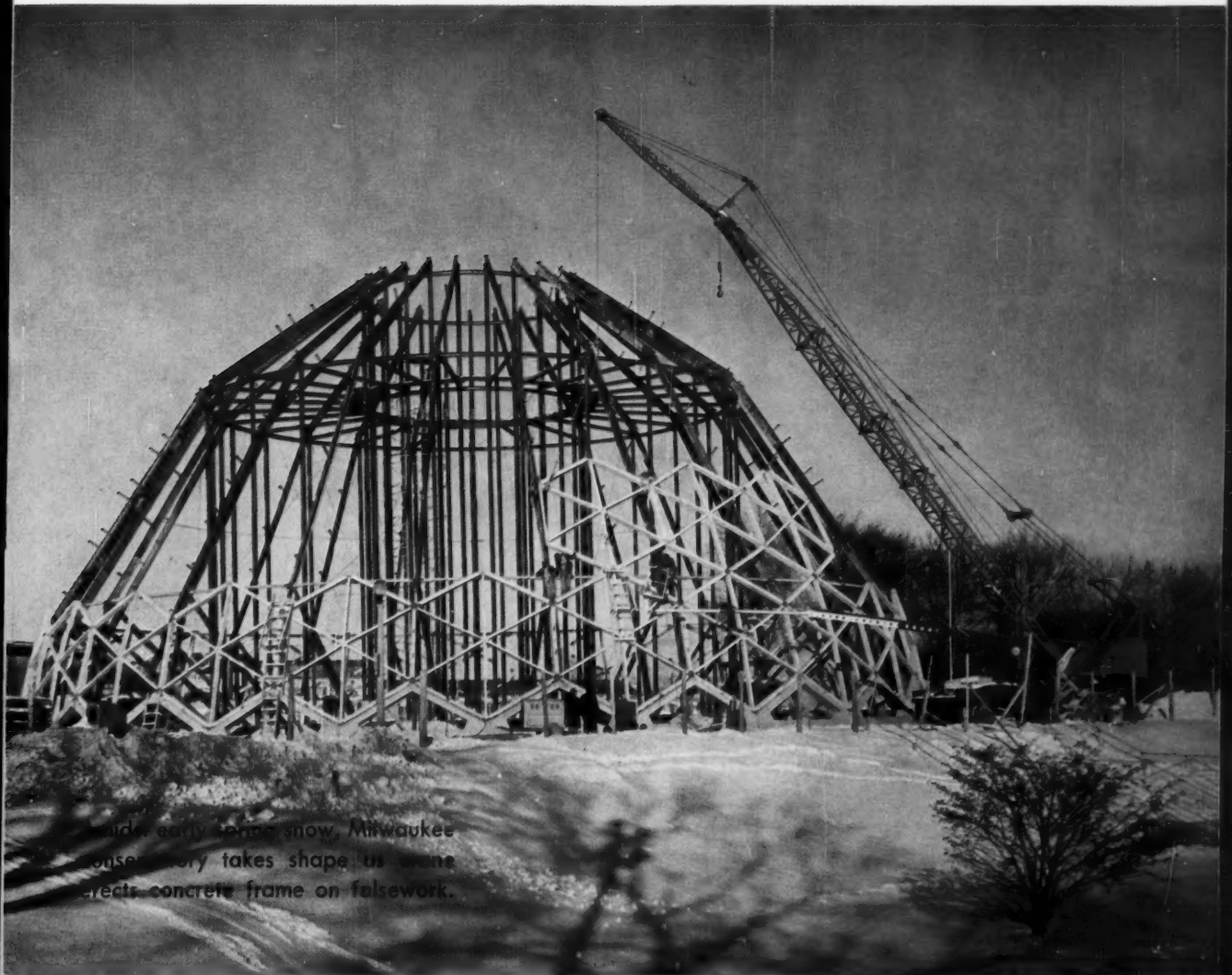
Page 214

APRIL, 1960

PRICE \$1.00


## *Construction Methods* AND EQUIPMENT

A MCGRAW-HILL PUBLICATION



Back early to the snow, Milwaukee Conservatory takes shape as crane erects concrete frame on falsework.

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*Foss Launch & Tug Co.'s crane lifts the 125-ton diesel locomotive and places it on the big barge while, in the foreground, Morrison-Knudsen's bulldozer gets set to apply the power.*

**"Operation Rescue" puts men and machines to test.**

A mud slide swept 4 locomotive sections and a coach of the Great Northern's crack "Empire Builder" into Puget Sound. Seven other cars were derailed. Double track lost totaled 2,063 feet. More than 1,000 feet of roadbed was buried under 12,400 cu. yds. of mud and debris.

Yet, 26 hours later, it was "business as usual" on the Great Northern. Foss Launch & Tug Co. rushed their 100-ton barge crane, equipped with Yellow Strand, to the job. Great Northern's locomotive cranes—also equipped with Yellow Strand—were rolling minutes after the disaster. And Morrison-Knudsen Co.'s bulldozers clambered

down to the site ready for work. The B & B Wire Rope salesman was called out at midnight to furnish a winch line for one of the bulldozers.

Each team had a job to do—and Yellow Strand Wire Rope did its share. With Yellow Strand you have confidence that comes with knowing you have the best money can buy. See your Yellow Strand distributor today! Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

***Yellow Strand***®



WIRE ROPE



SLINGS



CLIPS



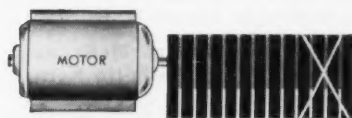
**B.F. Goodrich**

## V belt briefs

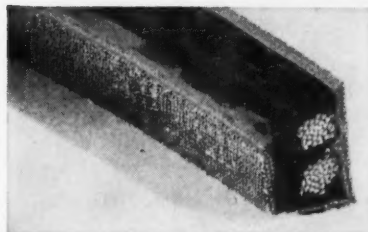
**TIPS ON THE CARE, MAINTENANCE AND SELECTION OF V BELTS FOR INDUSTRY**

### BFG V belts have 40% greater horsepower rating, cost no more

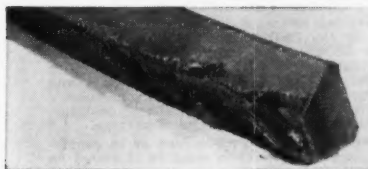
All B.F. Goodrich V belts now have 40% greater horsepower rating. This higher capacity rating was formerly found only in high capacity belts, but now costs *no more than former standard belts*. This means that lighter, more compact, and lower cost drives can now be used, because these B.F. Goodrich belts carry the horsepower needed for efficient drives using fewer belts at standard belt prices.

**LOAD** ↓*9 V belts can now do work of 13.*

### What caused these failures?



**Answer:** Prematurely worn sides are caused by grit, dirt or any such abrasive contact. Misalignment often causes wear on one side only. To prevent, align the sheaves, checking with straight-edge or cord. Keep belts and sheave grooves clean.



**Answer:** Belt put on improperly, or foreign objects fell into groove to rupture cover fabric. To prevent, move motor toward driven sheave when replacing belt. If rupture was caused by foreign object, protect belts with a cover.

### BFG double matching program keeps V belts matched during the life of the drive

Double-matching assures you that a set of B.F. Goodrich V belts are of equal length when installed and will stay uniform in length for the life of the belts. When V belts of different lengths are put on the same drive, longer belts loaf, while shorter ones carry all the load and fail quickly. B.F. Goodrich double-matched belts are measured *twice* for uniform length, once when manufactured and again after storage. Only belts that are of equal length when manufactured and after storage are grouped into sets.

Belts that are grouped into sets are tied together with a tag which gives the date when belts were matched. Belts which have been in storage over a year and "tag ends" are returned to BFG for replacement to make sure that your distributor always has a fresh stock of double-matched belts.

### How to protect against static electricity in V belt drive

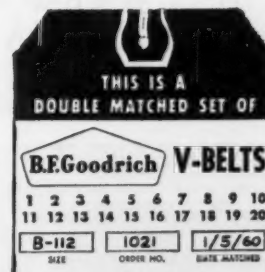
Static electricity is developed on every V belt drive. If there is an explosive atmosphere under certain conditions it can trigger an explosion.

Various means are used to get rid of this static charge. The most reliable method is in the use of static conducting V belts which are grounded to both the motor and the driven unit.

*But unless the motor and the driven unit are properly grounded there can be no protection regardless of the type of static conducting V belt used.*

Static conductivity in a V belt is made possible by special compounds used in the cover. Because cover wear reduces the belts' ability to conduct static, drives should be inspected frequently. Any belts showing cover wear should be replaced immediately. With any set of V belts, it is good practice to replace the entire set.

When ordering BFG Multi V belts, "static conducting" belts must be specified and cost slightly more. All BFG Maxipower V belts are static conducting and heat and oil-resistant at no extra cost.



*Here's the tag which goes on each set of double-matched belts, giving exact date belts were matched.*

### The Question Corner—



Grommet construction is exclusive in B.F. Goodrich V belts. Grommets are two extra strong cord loops, inside the belts, like twisted cables, except they are endless. Unlike ordinary belts, there are no center cords in the Grommet belt, so it is more flexible, can "give" temporarily and absorb shock loads.

Let your B.F. Goodrich distributor show you how this higher capacity, longer belt life, ability to stand hard use, can reduce your V belt costs per year and make other savings in operating and maintenance costs.

### Ask a factory-trained specialist

For help in selecting V belts for any kind of service, call the man who is a specialist in V belts—your B.F. Goodrich distributor. He can help you cut costs by getting longer life from your V belt drives. *B.F. Goodrich Industrial Products Company, Dept. M-795, Akron 18, Ohio.*

# B.F. Goodrich v belts

## HOW TO HANDLE WET JOBS

#55 of a Series

### DRY 18-FT DEEP TRENCH AT 3,700-FT ELEVATION

Sanitary Sewers, El Paso, Tex.  
Contr.: T.N.O'Kelley, Utility Contractors



AT THE REDUCED atmospheric pressure of  $\frac{2}{3}$ -mile above sea level, any pump works at a handicap. Despite this, the contractor desired to dry an 18-ft deep trench with his Griffin Wellpoint System installed on only one side.

• Question: in coarse, water-bearing sand near the Rio Grande River, with discharge lines as long as 700 ft, could such a well-point system achieve the necessary 18-ft lift?

• Based on previous local experience, it did not seem feasible. However, the Griffin system — installed on one side — successfully maintained a dry trench from the start, enabling T. N. O'Kelley to beat his 100-day time limit by 40 days.

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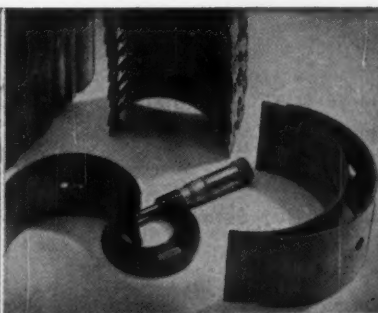
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#### ON THE COVER

A falsework system consisting of two concentric circles of 8-in. steel pipe standing on end and holding slanting I-beams supports the precast frames that form an openwork conoidal dome for a conservatory in Milwaukee. Welders connect reinforcing bars protruding from the corners of each precast piece to steel plates held by sections of 1-in. pipe to the falsework. When all 25 pieces in one of the six rings are in place, they then become self-supporting. See story beginning on page 159

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#### NEXT MONTH

The circular Utica Memorial Auditorium has an unusual roof structure. A tensioned cable system spans between an inner steel tension ring and an outer concrete compression ring. The outer ring was the trickiest to build; its complex cross-section required some fancy formwork, and it had to be placed with extreme accuracy to fit the cables.

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## Pay Dirt in This Issue

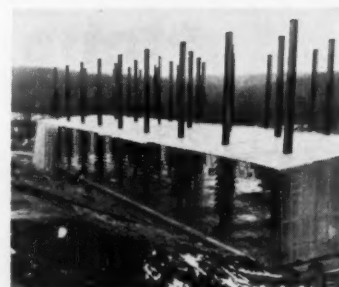
### Mechanical Miner Digs Storm Drain Fast... 97

With a comparatively simple rig he built himself, a Chicago contractor advances a 10x11-ft semi-elliptical bore 40 ft in an 8-hr shift. Ground is hardpan and stiff gravelly clay.



### Lift-Slab Concreting Goes on All Winter... 166

Concreting for two 160-ft high lift-slab buildings is no problem despite a harsh winter. The contractor pours 15 slabs per building under temporary polyethylene shelters.



### Better Compaction At Less Cost... 214

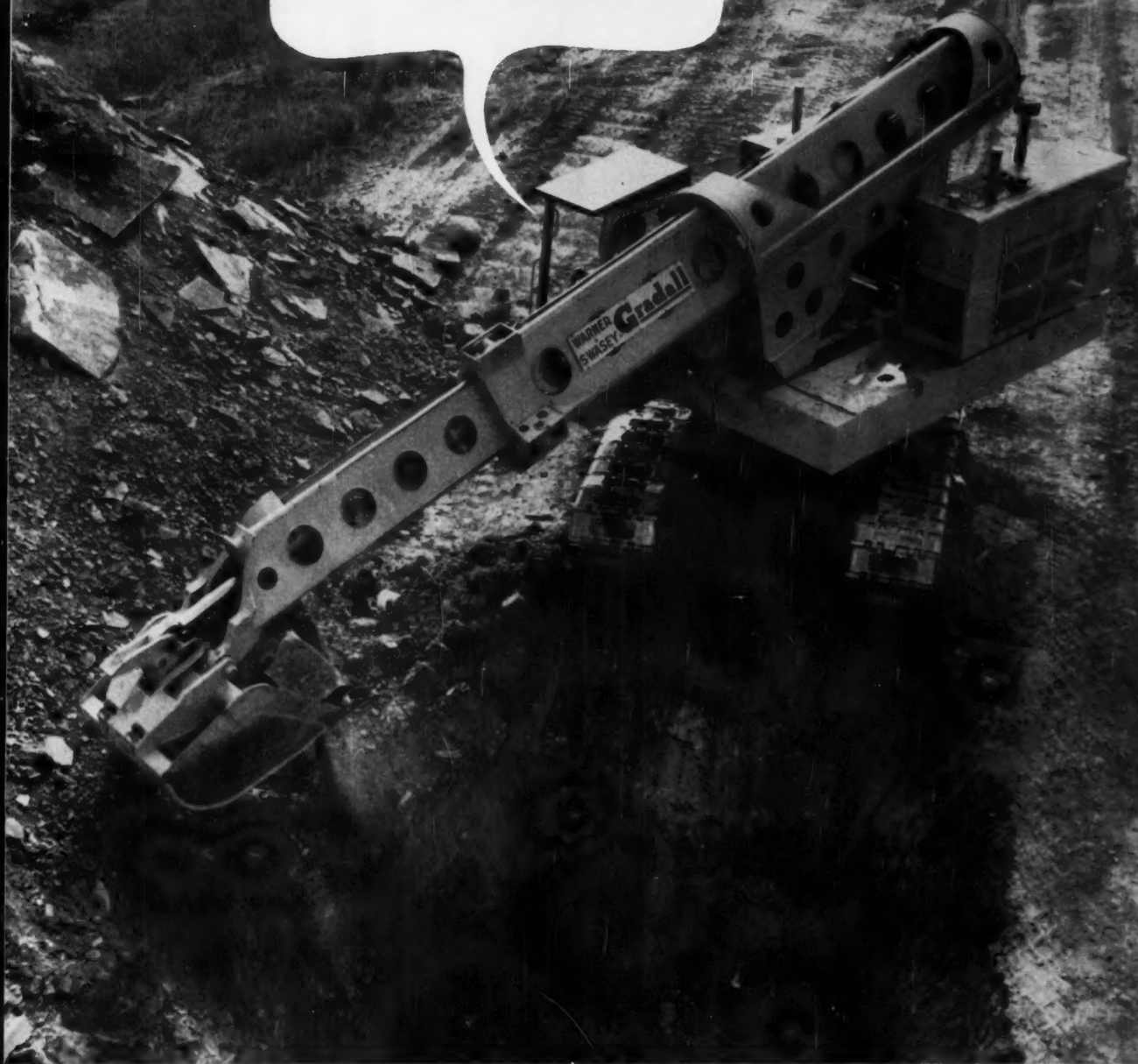
CM&E begins this month a series of articles dealing with all phases of earth compaction. The first covers specifications. Others will cover soils, machinery, and field methods.



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**Gradall...**  
*of course!*

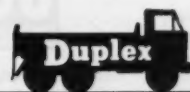


High production! The G-1000 digs deep trench through heavy shale and hard rock... accurately and fast!

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CONSTRUCTION EQUIPMENT DIVISION  
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PORTABLE  
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Today, on both large and small construction jobs, rugged, versatile Alemite Portable Service Stations are at work eliminating more and more equipment downtime . . . preventing costly delays due to slower lubrication methods . . . ending time-consuming trips to and from the grease shop . . . and reducing chances of expensive bearing failure.

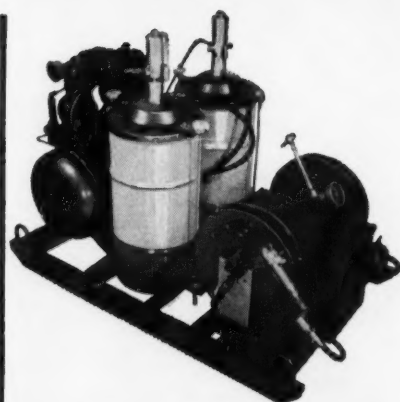
Whatever the type or size of your spread, an Alemite service outfit can be job-built from standard Alemite equipment to meet your needs. Equipment can be trailer-mounted or skid-mounted, as illustrated, for easy towing by pickup or other lightweight model truck. Or it can be permanently mounted on a truck bed.

Bring power lubrication right to your equipment—on the job—with an Alemite Portable Service Station. You'll make substantial savings in time, money, and equipment!

*Write for complete descriptive literature!*



Dep't. P-40, 1850 Diversey Parkway, Chicago 14, Ill.



**Versatile Alemite Portable Service Units** like this help you meet tight schedules . . . save lubrication and machine downtime on every piece of equipment. For example, skids can be furnished for following service combinations: Two pumps, two reels, 120-lb. drums • Four pumps, five reels, 120-lb. drums • Four pumps, five reels and 400-lb. drums. Alemite equipment, mounted on any universal truck bed, provides up to eight necessary services.



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doubt the  
Finest Crane  
I've ever run!"  
Says*

MR. JENSEN is an operator of long experience. What he says has more than ordinary meaning.

His comment is typical of the opinions we hear from all over the country. Your Northwest is always ready to go. Northwest Truck Cranes bring you High Speed Independent Boom Hoist—Power Load Lowering—Uniform Pressure Swing Clutches for smoother, easier control of the swing—Pin-connected booms—3rd Drums—the Feather-Touch Clutch Control and many other advantages specified for crane operation.

Northwest brings that same rugged quality into the truck crane field that has always been characteristic of Northwest Crawlers. They are the choice for the tough jobs.

There is a lot more to tell about Northwest advantages. Let a Northwest man bring you up-to-date.

*They're Always  
Ready to Go!*



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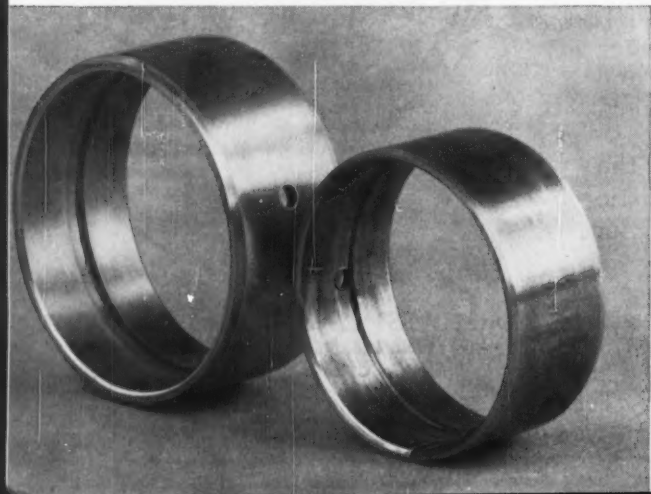


# Onan Electric Plants are when this independent



**Big, beefy bearings for longer life.** (Lower left) double-size Onan bearings vs. small bearings (right) used in many other makes. Larger bearing surface reduces wear, stretches time between overhauls. Onan builds up to performance—never down-to-a-price.

**The engine that ran equivalent to 487,888 automobile miles.** Here's endurance no auto could begin to match. Onan engine #1068 was operated for 12,197 hours. It was stop-started 100 times. At test's end #1068 and generator were delivering their stated output.





# Performance Certified only tester says O.K.

*His job is to provide a double-check on Onan's own tests and testing methods*

The man at the left is an expert from an independent testing laboratory. On the job, he believes nothing except what his trained eyes, ears and scientific testing instruments tell him.

He, and others like him, pay frequent surprise visits to Onan factories. He can pull any Onan plant off the test line. Put it through its paces. Recheck the checks Onan engineers and inspectors have already made. He has authority to pull a whole series of plants off the line if he

finds one fault. He does all this even though every Onan plant is tested for hours by Onan personnel *before it is shipped*.

Onan takes these special precautions to make *doubly* sure that you get all that you pay for, and more, when you own a Performance Certified Onan. For more details—and an analysis of your primary and stand-by power needs—see the Onan distributor nearest you. He's listed in the telephone classified section in all major cities. Or write direct.

**ONLY ONAN GIVES YOU THIS GUARANTEE**



**PERFORMANCE CERTIFIED**

We guarantee that when properly installed and operated this Onan electric plant will deliver the full power and the voltage and frequency regulation promised by its nameplate and published specifications. This plant has undergone several hours of running-in and testing under realistic load conditions, in accordance with procedures certified by an independent testing laboratory.

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# **Construction News From Washington**

Washington, D.C.  
April, 1960

## **Money Is Not Quite So Tight**

The squeeze of tight money on the construction industry shows signs of relaxing. It's too early to say how far the current trend will go. But with interest rates falling, bond prices rising, and the Federal Reserve adopting a less restrictive attitude toward the supply of credit, the outlook is considerably brighter than it was a month ago.

When the year began, the forecast was for higher interest costs and a declining supply of credit through most of 1960. It was widely assumed that public works and housing would be especially hard hit. Now it seems likely that funds for these purposes will be easier to find than expected and that interest rates will be lower.

The change is due primarily to lessening fears of inflation on the part of Federal Reserve officials, and to less demand for business loans than most credit authorities had foreseen. Federal Reserve officials stress that they do not see a recession in the picture. But they do think that the pace of business since the first of the year gives them a chance to let up a bit on the brakes without fear of starting another inflationary cycle.

## **Controls on Highway Awards**

Federal-aid contract awards by state highway departments will continue to be regulated for another year in accordance with a quarter-by-quarter schedule worked out by the Bureau of Public Roads. The program for the fiscal year starting July 1, however, will be somewhat easier to live with than the unbalanced first-year schedule, issued only last October, nearly four months after fiscal 1960 began.

The new schedule will limit obligation of federal-aid funds to the total amount apportioned for the same 12 months. This total—for fiscal 1961—is \$2.9 billion, up \$200 million from the current year.

Each state gets an allotment roughly equivalent to the overall fiscal 1961 apportionment it received last fall. This allotment may be obligated for interstate or other federal-aid projects in any proportion the state chooses. Also, for the coming year, the quarterly rate allows a uniform 25% to be obligated in each three-month period, an improvement over the uneven rate imposed last fall on this year's obligations.

Reimbursement planning is the name BPR applies to the control valve on new obligations. That term describes its purpose: to make sure the Highway Trust Fund will have sufficient funds to reimburse the states when they send in vouchers showing payments made for the federal-aid work.

*continued on next page*

### **Racial Discrimination on Construction Jobs**

Contractors are caught in the middle by efforts of the President's Committee on Government Contracts to break down racial discrimination on federal construction projects.

Last month the committee decided to require every contractor on a federal project to supply complete data each month on hirings, firings, promotions, and demotions plus a hiring timetable for the life of the job for each craft or trade. If carried out as proposed, the contracting officers of all government departments and agencies would be responsible for collecting these data monthly from all contractors under their jurisdiction.

The decision grew out of an attempt to break down apparent discrimination by a Washington, D.C., union local that referred only white electrical workers to two federal building projects in the national capital. Because the committee could not force the union to accept Negro members, it applied pressure to the prime contractors and their electrical subcontractors to live up to the non-discrimination clause contained in all government contracts.

Information from the contractors on future employment schedules was needed to establish the testing ground for non-discriminatory hiring. Rather than single out the Washington jobs alone for this requirement, however, the committee moved to make it nationwide to include all federal projects.

### **On-Site Picketing**

The AFL-CIO Building Trades Unions campaign to ease restrictions on construction site picketing is still alive in Congress, but union hopes for approval are fading. Craft union leaders are advised on Capitol Hill that prospects for labor legislation this session aren't high—even though Congressional leaders have promised to try to eliminate the Taft-Hartley prohibition against construction site picketing where it hurts a contractor or subcontractor not directly involved in the dispute. This is an illegal secondary boycott under Taft-Hartley rules.

Union lobbyists are still working hard for the legislation. A Building Trades legislative rally, attended by 3,000 union delegates, was staged in Washington recently to promote the measure. However, heavy opposition by contractors has chilled some supporters of the union proposal in Congress. Too, a short Congressional session may prevent the bill from coming to a vote.


### **Bidders Buy and Keep Corps Plans**

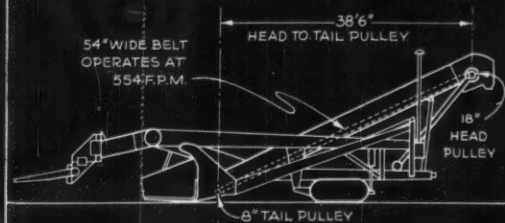
Prospective bidders now may purchase either full-scale or half-scale plans of Army Engineer projects—civil or military—on which bids are invited. The Corps has eliminated a requirement that a bidder must buy a half-scale set of plans before he can purchase full-scale sheets. Single sheets, under the revised ruling, are priced at 50 cents for the full size and 10 cents for half scale, but a bidder will pay no more than \$10 and no less than \$1 for a set of plans. Specifications are free, and bidders need not return the plans.



**Moving mountains of earth against a deadline** looked like too tough a job for conveyor-type loaders. Most work crews on this big Midwestern dam project didn't even try them—others quit when they hit the first belt-wrecking ledge of shale. But one contractor kept his loaders going full tilt. And many of them were equipped with rugged conveyor belts recommended by the G.T.M.—Goodyear Technical Man. The belts' box score: those supplied through the G.T.M. worked rings around the other brands he tried. In fact, one Goodyear belt handled a whopping 528,925 cubic yards before retirement; another loaded 329,121 yards. And both can be compared with a 235,000-yard average for all the loader belts on this job.



GOODYEAR INDUSTRIAL PRODUCTS  **Specified**  
Conveyor belting for automatic loader



Remember—you can never be sure you're getting the most out of conveyor belts—or any other industrial rubber product—until you check with the G.T.M.

It's easy to reach him in short order, too—simply by contacting your Goodyear Distributor. That's also your source for the longest-lasting, most moneysaving V-Belts, Hose and other products. Just look in the Yellow Pages under "Rubber Goods" or "Rubber Products"—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

THE BIG NAME IN CONVEYOR BELTS:

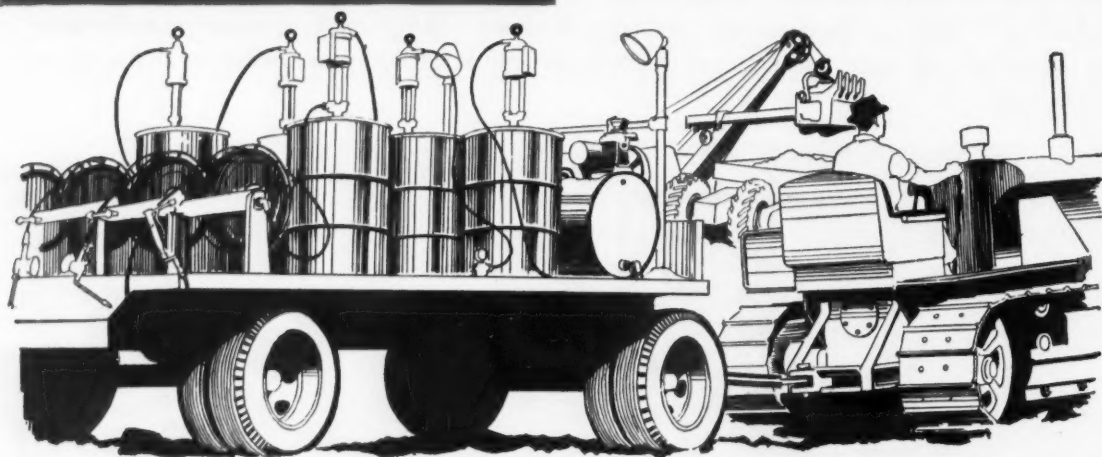
**GOOD  YEAR**

THE GREATEST NAME IN RUBBER

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# LUBE LOGIC

## Tips for more



### Do-it-yourself lube rig trailer

Maybe you're aware of all the advantages of a mobile lube rig, but just don't want to tie up a truck for this purpose. Or, perhaps you'd like a supplementary rig. You can solve either problem neatly by mounting your field lubricating equipment on a standard 5-ton farm trailer. That way, you can take your whole simplified lube plan out into the field where it's needed, without costly deadheading back to a fixed service point—and you can move the lube rig just by hitching

it to any truck, so it's just as mobile as a truck mounted rig at much less cost. And here's a bonus: by hitching your lube rig trailer to a bulldozer, you can take field service to spots that wouldn't be accessible to a regular truck.

Trailers for this purpose, as well as tanks and pumps, are all standard items you assemble yourself to meet your own requirements.

### TEXACO LUBRICATION ENGINEERS ON THE JOB FROM COAST TO COAST



**ROCKY REACH DAM AND POWERHOUSE** on the Columbia River, Washington (above). W. N. Evans (left), Manager for Rocky Reach Contractors, discusses Simplified Lubrication Plan with E. S. Saunders, Texaco Contractor Sales Representative.

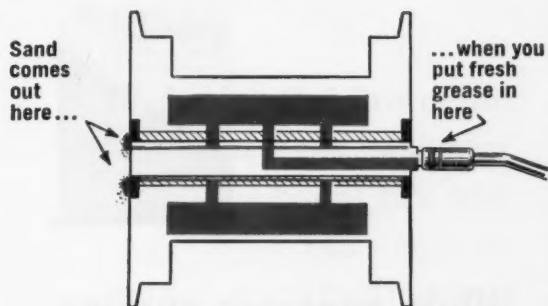


**HOGBACK DAM**, Riverton, Conn., (upper right) is part of the greater Hartford water supply system. Texaco man-on-the-job is H. F. Porter (left) shown with John Toffalon, Vice President, White Oak Contractors, Inc., General Contractors.



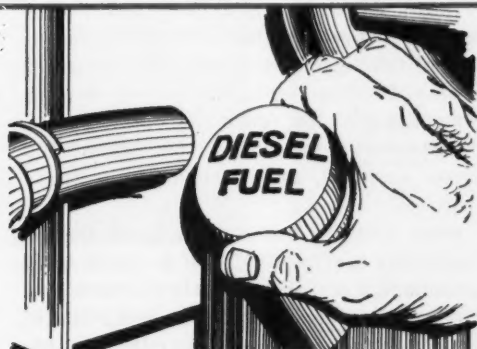
**INTERSTATE HIGHWAY 80 PROJECT** at Colfax, Iowa (right). Texaco Engineer E. A. Howles (right) works closely with Mott Construction Company on the important assignment of keeping equipment on the job and maintenance costs low.

# efficient maintenance



## Track-roll enemy No. 1: sand

If you're operating a crawler-tractor in sandy soil, the best way to keep sand from getting into the track-roll bearings is to keep purging the bearings with fresh grease. Track-roll bearing seals are especially designed for this type of purge-lubrication, and the grease that comes out around the edges of the seal during lubrication carries the sand out with it.



## Identify the fuel you want

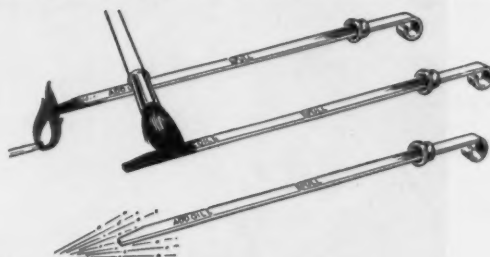
Let one absent-minded maintenance man put gasoline in your diesel tank and as the fliers say "you'll be bailing out over Denver." It's happened. Best way to avoid its happening to you is to mark your fill cap "Diesel Fuel" or "Gasoline". Then nobody should make any mistakes.



### TEXACO LUBRICATION ENGINEERS

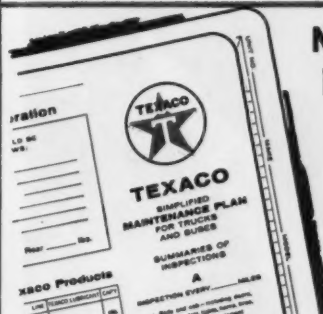
Every month we'll bring you a batch of "sleepers", little angles, so easy to overlook, where big savings in money and time can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."

Texaco Inc., 135 East 42nd Street, New York 17, N.Y.



## How to read dipsticks without squinting

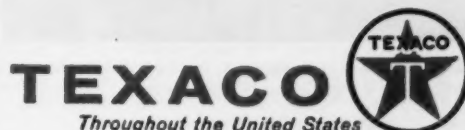
The modern inhibited motor oil that keeps the inside of your engine clean also keeps the oil dipstick clean—and often too shiny to read. Here are three solutions for this problem—take your choice. 1. Heat the end of the dipstick so the metal darkens slightly. 2. Paint the end of the stick with a dull-finish cellulose lacquer. 3. Run the stick across the spark-plug cleaner to take off some of the shine. (If you use the spark plug cleaner, use the smallest rubber plug bushing and hold the dipstick over the hole with a wad of cloth to keep sand from scattering around the lube bay.)



## NEW TRUCK RECORD FOLDER fits itself into your schedule

Texaco's flexible new truck record folder lets you stick to the lube schedule that works best for you without running into bookkeeping problems. Lubrication and oil schedules are completely separate from mechanical maintenance and replacement parts schedule—you don't have to follow any pre-established routine to use the folder profitably. And this new folder accounts for every single dollar you spend on truck maintenance for a whole year. Write for your folders today.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV



Throughout the United States

Canada • Latin America • West Africa



## **White concrete curbing increases highway safety**

White concrete reflecting curbing, made with ATLAS WHITE portland cement, is a highly efficient safety-aid on highways, roads and streets. At night, the curbing gives the impression of being lighted, yet the effect is actually the reflection of headlight rays striking the corrugated surface. On rainy nights, the curbing becomes even more reflective. And during daylight hours, the whiteness of the concrete contrasts with the darker pavement, sharply outlining the road's edge.

When installing this highway safety feature, contractors specify ATLAS WHITE DURAPLASTIC air-entraining portland cement in the mortar mix. The uniform whiteness of this cement produces a concrete that has the necessary reflectivity. Because it is air-entraining, this cement produces a more durable concrete that resists exposure to freezing-thawing weather and the application of de-icing salts. For literature, write: Universal Atlas Cement, 100 Park Ave., New York 17, N. Y.

OFFICES: Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco

CB-66

"USS," "Atlas" and "Duraplastic" are registered trademarks

**Universal Atlas Cement  
Division of  
United States Steel**





# B.F. Goodrich develops 2 new long-wear tire compounds

**B.F. Goodrich Cut Protected and Heat Resistant compounds boost tire life, cut costs on heavy construction and earth-moving jobs**

**T**HE most costly tire-killers on construction projects are either rock cuts or heat build-up. A B.F. Goodrich research team went to work on the problem, tested and researched various compounds, then developed the first truly Cut Protected and Heat Resistant compounds on the market.

Cut Protected compound gives longer service on jobs where:

- Rock cutting, chipping and abrasive wear are severe.
- Round-trip hauls are short.
- Trucks travel at low speeds.

Heat Resistant compound defies heat build-up on jobs where:

- Haul roads are well maintained.
- Trucks travel at high speeds.
- Cutting and chipping are at a minimum.

Tests show these compounds outperform any others available today. Ask your B.F. Goodrich dealer about them—find out how they can save *you* money.



**HERE'S UNRETOUCHED PROOF** of how the new B.F. Goodrich Cut Protected compound wears longer. Both tires were in service at the same time on identical jobs under identical conditions. Yet the Cut Protected compound tire above has given *approximately 3 times more service* than the tire below. Note how little the Cut Protected tread is worn.



**SCRAPER HAULS 35 TONS OF CLAY AND SAND** to grade new Interstate Highway No. 1202-(1)-9 in Conecuh County, Ala. Equipment works 60 hours a week on stop-and-go runs of a mile or less. Here's a job for the new B.F. Goodrich Cut Protected compound. On long, high-speed hauls, you'd choose the new Heat Resistant compound.

**More highway construction news from B.F. Goodrich** ►



**RUSHING HIGHWAY CONSTRUCTION** near Lackland Field, this giant Killian-House scraper is loaded with 30 tons of earth. Tires are B.F. Goodrich Rock Service Tubeless, designed with massive double-chevron cleats for extra traction, forward or reverse. Rock Service tires are available in the new Cut Protected compound that defies rock cuts and snags, in the new Heat Resistant compound that withstands dangerous heat build-up, or in the Regular compound for normal service.

## How long-wear B.F. Goodrich tires



**HYDRAULIC DUMP TRUCK** deposits asphalt to pave highway 25 miles southwest of San Antonio. Front tandem tires are B.F. Goodrich Power Express. Rear tandems are Traction Express on 4th retread. B.F. Goodrich FLEX-RITE NYLON cords withstand double the impact of ordinary materials, resist heat blowouts and flex breaks. That's one reason why Traction Express tires can be retreaded again and again.

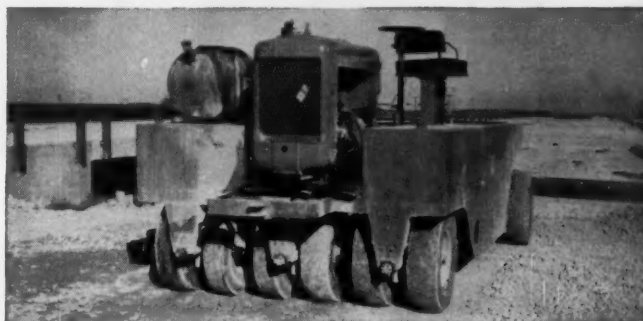


**B.F. GOODRICH ON-THE-JOB SERVICE** helps contractors cut costs to a minimum. Servicemobile is equipped with all the latest power tools, including hydraulic cranes, bead jacks and pneumatic wrenches. B.F. Goodrich Tire Service Men handle any type tire on any type equipment, work quickly and efficiently. Best of all, B.F. Goodrich Tire Service Men are there when you need them.

**6,000-GALLON WATERWAGON** rolls on B.F. Goodrich Earth Mover tires. Note the unusual "button" tread. Hundreds of sharp edges bite into the ground to keep the tire from skidding or slipping. Yet the Earth Mover's wide tread keeps the tire on top of soft soil. Work stays on schedule.



**HELPING COMPACT EARTH** is the job of the 13 B.F. Goodrich smooth-tread tires on this road roller. Other Killian-House equipment includes 30 flat bed and water trucks, 10 scrapers, 15 maintainers, 30 pickups and 30 hydraulic dump trucks—all on B.F. Goodrich tires.



**KILLIAN-HOUSE RELIES** on B.F. Goodrich truck and trailer tires to move 200 amp. welding machine to equipment repair jobs. Altogether, this contractor uses nearly 800 B.F. Goodrich tires to help speed highway construction in Southwest Texas.



**Smileage!**

## keep highway construction on the go

**K**ILLIAN-HOUSE, one of the biggest highway and bridge construction companies in Texas, operates out of headquarters in San Antonio—maintains three field offices with 2-way radio hook-up to help service jobs currently worth more than twelve million dollars.

Every day a fleet of 143 units goes to work on B.F. Goodrich tires—scrapers on Rock Service tires, dump trucks on the Traction Express, maintainers on Power Grader tires, water trailers on Super Traction tires, pickups on the Power Express—even company cars on B.F. Goodrich Life-Saver Tubeless tires.

Why this vote of confidence in B.F. Goodrich? "Because,"

says General Superintendent Glen Quick, "they are the best tires for the job. For example, we once got only 30,000 to 50,000 miles from truck tires. Costs were enormous. Now B.F. Goodrich Traction Express tires give us 60,000 to 90,000 miles, cutting our costs in half."

Why not have a talk with your B.F. Goodrich Smileage dealer. He has long-wear tires for every type of off-the-road work and tire service that keeps construction on the go. Look under Tires in the Yellow Pages of your phone book. *The B.F. Goodrich Company, Akron 18, Ohio.*

**SPECIFY B.F. Goodrich Tubeless or tube-type tires when ordering new equipment**

**OFF-THE-ROAD TIRES BY**



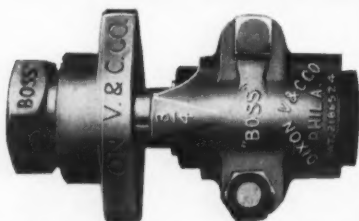


# Reliability THAT ASSURES Lower Drilling Costs!



## "GJ-BOSS"

### AIR HAMMER COUPLING



The washerless coupling for all heavy-duty air hose connections to hand drills, wagon drills, drifters, jumbos. Famous for strength, durability and efficiency. Quickly connected and disconnected, with no lost or worn-out washers to replace. Compact and Heavy Types.

"BOSS" Air Hammer Coupling—same as above except Washer Type.

For lighter services—"GJ-Dixon" and "Dixon" Air Hammer Couplings.

## "BOSS" Self-Honing AIR VALVES

Used for the efficient control of air on compressors, manifolds, headers, sump pumps, etc. Strong, durable, compact. Self-adjusting, quick-opening, full flow. Male or female I.P.T.



Bronze plug automatically hones to perfect seal against harder metal of valve body.

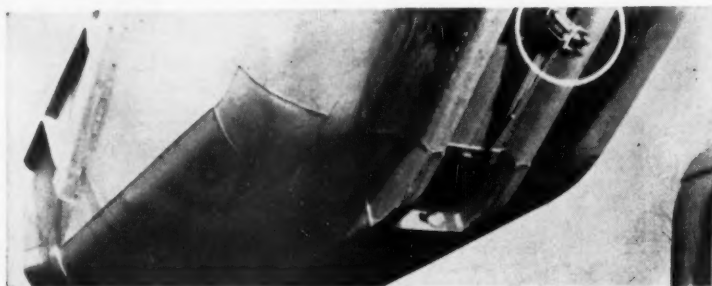
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# DIXON

Valve & Coupling Co.

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Buck Iron Company, Inc., Quarryville, Pa. · Precision Driven Steel Company, Camden, N.J.

## Job Talk . . .

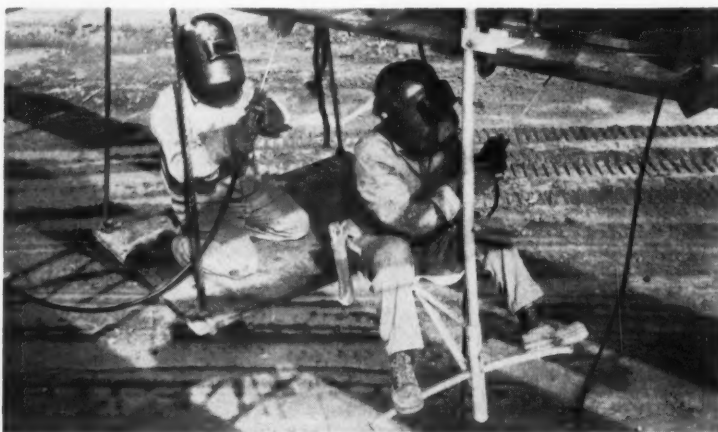


### Vibrators Clean Concrete from Trucks

Concrete for the runways of Dulles International Airport near Washington, D. C., was sticking to the sides of Dumper trucks feeding the paving train. Shoveling it out or knocking it loose by banging the bodies with sledges was slow and costly. So C. J. Langenfelder & Sons, the paving contractor, installed a pneumatic vibrator on each of their 30 Dumpers.

Mounted near the front of the

dump body and connected with a hose to the 80-psi air brake system, the Cleveland 1½-in. Type F vibrator delivers 5,000 hammer-like blows per min, shaking loose any material that refuses to be dumped. A valve at the rear of the truck, connected by flexible rubber hose to the vibrator, regulates the flow of air. Lubricating oil for the vibrator is automatically introduced into the air stream.



### Suspended Seat Holds Welder Close To Work

A seat mounted on a telescopic steel mast provides a safe, convenient perch for welders working overhead on bridge girders or other structures.

Made of tubular steel scaffolding sections, the entire assembly hangs from a bracket wrapped around the top flange of the girder. Holes punched at 12-in. intervals in the mast hold pins that position the seat at a convenient level. A circular steel

rail 9 in. above the seat and a safety chain provide insurance against falls.

The mast is also equipped with adjustable ladder rungs for safe climbing and a curved tubular footrest. The 'bosun chair' can be swung around the mast to position the welder most conveniently. The unit, manufactured by P. H. Mallog Co., Niles, O., weighs 45 lb.

continued on page 23





Report on the all-purpose Cat No. 619 with No. 442 Scraper

**"This rig has more features than anything we looked at in its class. More power, speed, maneuverability"**

George Hudson, Construction Supt., Grant County, Wis.

To keep an 8 to 10 mile per year road building program on schedule, Grant County needed a fast, compact mobile earthmover for use on longer hauls and larger yardages. After testing competitive rigs, a demonstration sold the county on a Cat No. 619 with matching No. 442 Scraper. Reason: it has more "bonus features" than any other machine in its class.

First assignment for the No. 619—relocating a half mile of road to eliminate a bad curve. 14,000 cu. yd. had to be removed to make a 14-ft. cut. The job proved to be a stop-and-go affair—haul distance 375 ft.—with tough material—sand, rock and clay so stubborn that much of it needed ripping. The No. 619's lugging ability and easy handling on sharp turns pay off. And on longer hauls, Superintendent Hudson reports the No. 619 "climbs up a 5% grade in 4th gear with a good load."

Here are some reasons why the No. 619-No. 442 is an "all job" rig loaded with performance. A Turbocharged Cat Engine delivers 225 HP and high torque rise for fast acceleration and lugging power under capacity loads. The LOWBOWL Scraper handles 14 cu. yd. struck ... 18 cu. yd.

heaped. The No. 619-No. 442 team has 30 MPH *usable* operating speed ... hugs the ground for roadability found in no other 2-wheeled earthmover of its capacity. Newly developed 2-jack hydraulic steering gives effortless maneuverability yet retains "feel of the road" control. This advance steering permits full 90° turns in a diameter of 30 ft.

Get the full story on this hurry-up, all-purpose rig from your Caterpillar Dealer. Ask for a demonstration under the job conditions you face. See how you can make use of its versatility to step up production on your job.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

**CATERPILLAR**

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**NO. 619-NO. 442  
FOR "ALL JOB" VERSATILITY**

How **protection in depth** helps cut compensation costs

## Minutes make a difference when a worker is badly hurt

Quick help for your accident victims can save more than a life or a limb. It can also save you compensation premiums. Working out of 106 offices coast to coast, Liberty claimsmen act fast to see that your worker receives proper care. If necessary, consulting medical specialists are rushed to his hospital bed. A rehabilitation nurse begins her liaison with patient, doctor and policyholder to speed recovery. Detailed claims investigations are made while the facts are fresh. This thorough, emergency action is but one of the many Liberty Mutual services that add up to protection in depth. To learn more about Liberty's protection in depth and how it can help lower your business insurance costs, just get in touch with the Liberty Mutual office nearest you.



Look for more from **LIBERTY MUTUAL**

*...the company that stands by you*

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY  
HOME OFFICE: BOSTON

Business Insurance: Workmen's Compensation, Liability, Group Accident and Health, Fire, Fleet, Crime • Personal Insurance: Automobile, Fire, Inland Marine, Burglary, Homeowners



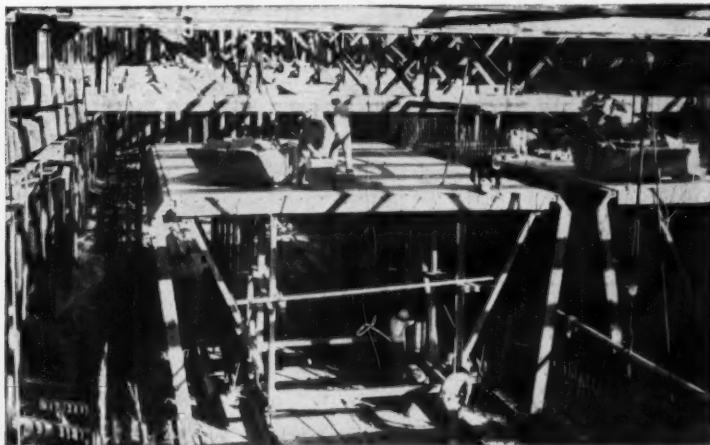
## Trailer Handles Canopy Form

A collapsible trailer-mounted form enables the Carter Division of the Humble Oil Co. to construct hyperbolic paraboloid canopies for their gas stations at a cost of only \$3 per sq ft. That's 25% cheaper than concrete construction formed with steel or wood.

A steel frame of channels and light WF beams holds two halves of the form that fold down on each side of the four-wheel, rubber-tired trailer on which it rides to the job site. The 24-ft-sq form consists of plywood covered

with  $\frac{1}{8}$ -in.-thick sheet metal. A metal tube forms the circular column at the center to support the canopy. The assembly operates hydraulically. It weighs 7,000 lb.

Jack Christiansen, structural engineer with Worthington & Skilling, Seattle, designed the form. Proctor Products of Edmonds, Wash., built it. Carter expects to get as many as 150 reuses with the collapsible form. They already have poured 10 canopies with it in the Seattle area.



## Interlocking Steel Forms Speed Concreting

A special interlocking steel form is speeding concreting of a 900-ft-long twin-tube tunnel in Fort Lauderdale, Fla. Thorington Construction Co., Richmond,

Va., claims the Blaw-Knox forms reduce set-up and knock-down time 20% over other forms in use on the project. The interlock-

*continued on page 29*

## COMMENT from the BUTLER ENGINEER

. . . of unbelievable  
accuracy in tunneling  
. . . and a Star at the  
Ready Mixed Show

A really great engineering feat! Blue River Constructors have just completed the boring operation for the Roberts Tunnel under the Continental Divide. But man, that hole is 23.27 miles long. Bored from both sides—and when the two crews met in joining they were only  $1\frac{1}{4}$ " off sideways and only 2" from top to bottom! 23.27 miles is 1,474,388.04 inches. Percentage wise the margin of error is  $1.25 \div 1,474,388.04$ . Aw, you figure it. My slip-stick can't squat that low.

*And we're no end happy to report that the equipment to line the tunnel with concrete will be by Butler.*

Highly automated equipment shown at the Ready Mixed show. All of it good, too.

But Butler Bin popped up with a great new advance in a control system. Designated as the SP, it requires only setting two dials and touching one push button for a complete batching operation.

Mix selections are obtained by what we call a Mix Capsule. Any number can be used. Set another dial called the Batch Splitter to get the amount of any mix you want in increments of  $\frac{1}{4}$  cu. yds.

The SP is so completely automated, so thoroughly interlocked and so darned simple it's absolutely fool pr—(no, I don't like that word.) Let's call it absolutely human-proof. Not by our vote—but by the consensus of hundreds of Ready Mix owners attending the Show, Butler is again a great big step ahead of all the rest. Write for the SP Bulletin.

*The Butler Engineer*

BUTLER BIN COMPANY  
WAUKESHA, WISCONSIN



# 310 FOOT BOOM

## P&H 110-ton Crawler Erecting Crane Tops Out 30 Story building with world's longest boom

Here's a construction "first" established by Chas. V. Castaldo Construction Corporation, Bronx, New York, in the erection of the new Imperial House apartment buildings in Manhattan.

**With this P&H rig, they started with a 200' boom for the first 15 floors.** Using a 3 yd. concrete bucket, they averaged 60 cu. yds. per hour by handling a load every 3 minutes! . . . a pretty fast pace in the middle of Manhattan! All work motions being independent of each other really counted in producing the speed needed for this fast pour.

**For the 16th to the 21st floors, 50' more boom was added—total boom length—250'.** For an average pour, let's take the 20th floor: 42 cu. yds. per hour with a 3 yd. bucket! This was possible because of Magnetorque® swings which speeded up the entire work cycle through faster, frictionless swings. (Even later at 310 feet up there was no "fly-rod" action and boom side stress was

greatly reduced). The 1015 has no linings to replace . . . no adjustments or maintenance are necessary. Think of the time Castaldo saved on this one P&H feature alone!

**They weren't through yet!** A 50' jib was the next addition for pouring from the 22nd to 29th floors—total now: 300' boom. Here they handled 2 yds. of concrete with a typical output average of 37½ cu. yds. per hour.

**Finally, to top out everything, another 10' jib insert was added.** It was used to pour at the 29th and 30th floors and penthouse . . . an unequalled 310' of boom pouring 1½ yds. of concrete with an average output of 35 cu. yds. per hour.

Safety was a prime characteristic of the entire operation through the independent planetary boom hoist with single directional cam clutches which provided "triple-safe" operation.

**Equally important to Castaldo's work is the mobility of this outstanding rig.** The morning after the job was finished, the boom was dismantled and the machine loaded on trailers by 10:00 a.m., moved across town and set up with 250' of boom ready for a new project by 5:00 p.m., the very same day.

Castaldo's many jobs also call on the ability of the 1015 to lift 110 tons with a basic 50' boom, at a practical 15' radius.

Between this 110-ton crawler erecting crane and the 12½ ton Heavy Duty Miti-Mite—regardless of your capacity needs—Harnischfeger has a crane to do your job faster and at a lower cost. For more information, just mail the coupon to Harnischfeger Corporation, Construction and Mining Division, Milwaukee 46, Wisconsin.

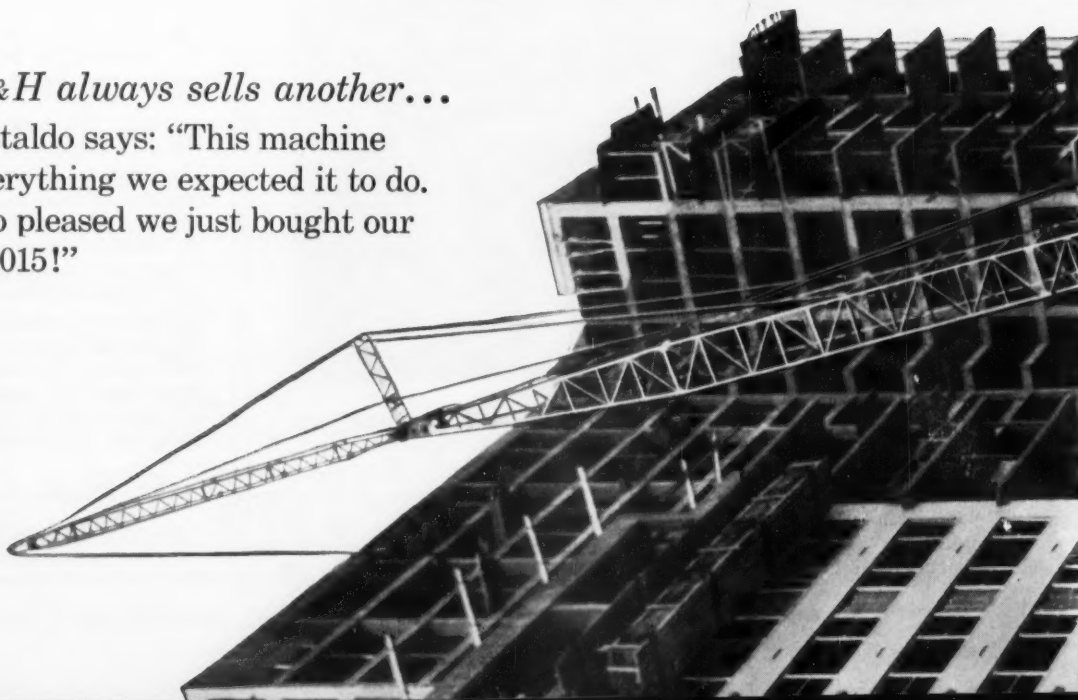
## HARNISCHFEGER

Milwaukee 46, Wisconsin

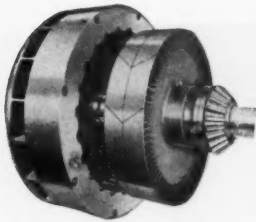


*One P&H always sells another...*

Mr. Castaldo says: "This machine does everything we expected it to do. We're so pleased we just bought our fourth 1015!"







### THIS IS MAGNETORQUE

Precision control through Magnetorque swings eliminates whip on this job, reduces boom side stress—no linings to burn out or replace . . . gives better acceleration and deceleration for consistently better production.

### 3-HOUR TAKE-DOWN!

That's all Castaldo required—even with 250 feet of boom and 60 feet of jib. 3 hours after start, everything is down, trailer loaded, ready to move to the next job. Low, overall height (13 feet with gantry in folded position) simplified transporting and operation in restricted areas.



**Harnischfeger Corporation, Construction & Mining Division,**  
4400 West National Avenue, Milwaukee 46, Wisconsin

- ☐ Would like a copy of the case history of this 110-ton P&H 1015 working on the Manhattan project.
- ☐ Send along literature, specifications and additional information on this 110-ton rig.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_





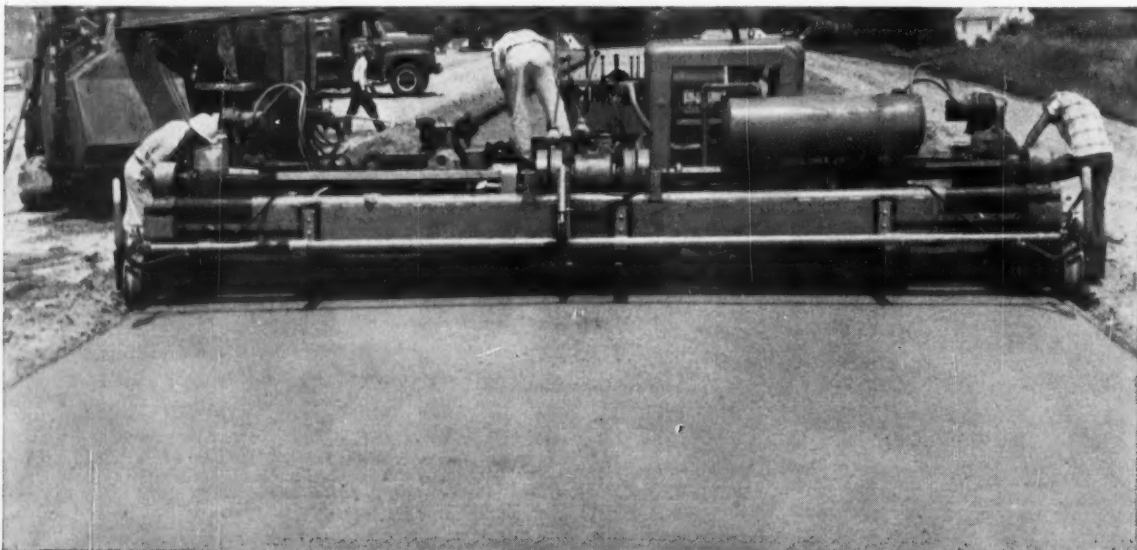
**1** **HYDRAULIC SPREADING SCREWS**, controlled by light-touch levers, remix as they spread to form a denser, stronger, uniformly-textured slab. Eliminate segregation and honeycomb. Right and left screws can be

started, stopped or reversed independently. Operation of screws, and lifting and lowering of screws, strike-off and screed, are controlled with perfect ease and smoothness of hydraulic operation. Jaeger originated screw spreading.



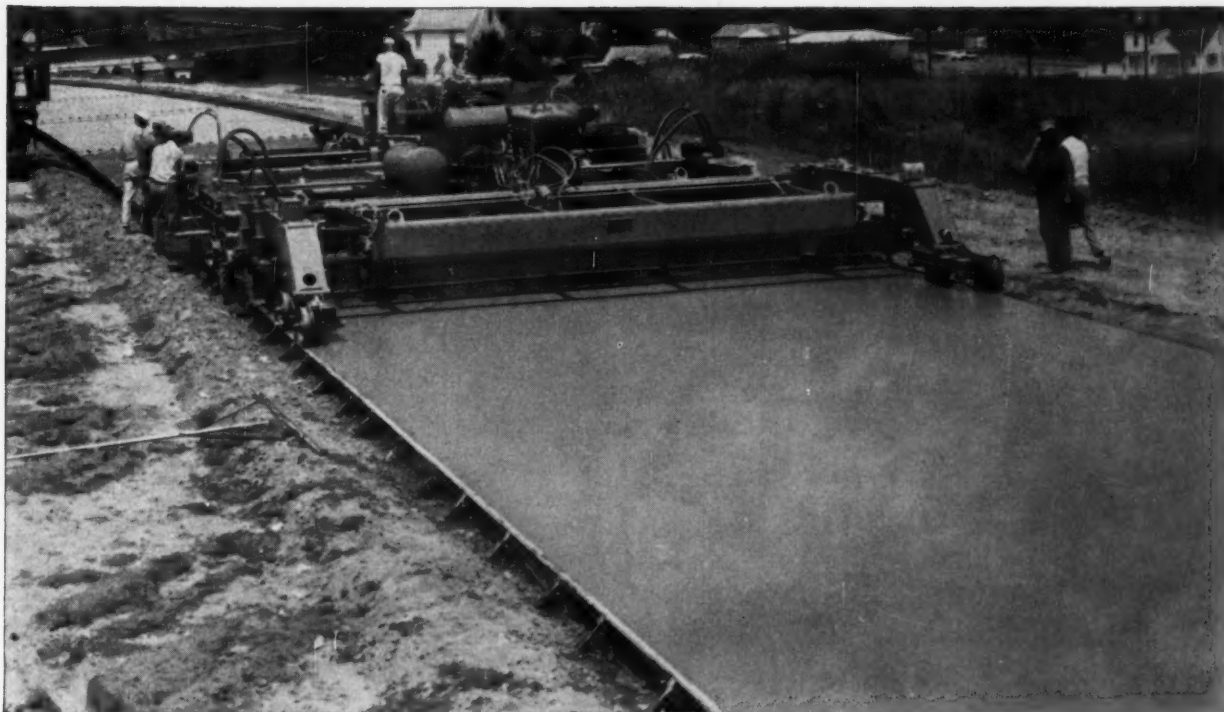
**2** **PLACEMENT OF A SECOND COURSE** is easily handled by the same spreader-finisher if only one paver is used. With two or three pavers, top-speed continuous

progress is maintained by adding a Jaeger spreader to place and strike-off the base course and following with your spreader-finisher on top course after mesh has been laid.



**3** **BEHIND THE SPREADER. LOOK AT THE IDEAL SURFACE THE FINISHER WILL WORK ON:** One man, on Jaeger spreader-finisher, not only does the spreading but

also finishes an accurately metered surface ahead of the finishing machine. Metering here reveals any excess or deficiency of material where it is easy to correct.



4

**FINAL FINISHED SURFACE IS AN ENGINEER'S DREAM:** Towed by a Jaeger tandem screed finisher and controlled by the same operator, the Jaeger finisher-float gives the final 4-to-1 correction of any surface

inaccuracies. It rides on bogie axles. Its oscillating screed and float pan are both suspended, independent of form levels alongside. (You can also use this float-finisher behind any make of finishing machine. Detaches in 2 minutes).

## HOW 2 MEN LAY SUPER-SMOOTH PAVEMENT WITH JAEGER 4-SCREED TEAM

**One spreads and finishes, the other finishes and floats. For 2-course work, simply add a base spreader.**

By using Jaeger's *integrated* paving train, low-bid contractors are saving labor all along the line — and delighting highway inspectors with the

smoothness of their finished slab. On 2-course pavement, if you are using only one paver, the same machine also spreads, but does not screed, the base for reinforcing mesh.

For fast, 2-paver production of 2-course slab, you need only add another spreader, without a finishing screed, to lay the base.

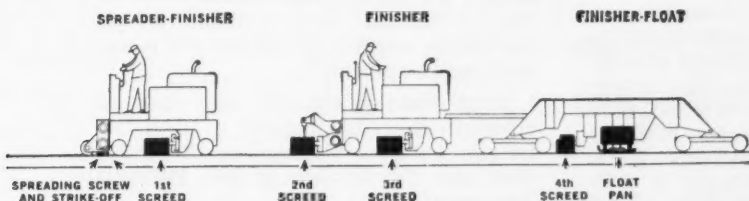
any finisher. It imparts the final kiss-finish with its narrow oscillating screed and 30" wide float pan.

### MACHINE-PERFECT, READY FOR BURLAP

Both the screed and pan of the finisher-float are suspended, independent of adjacent form level and its bogie axles provide a 4-to-1 ratio of correction. The accuracy of finish being obtained with this equipment is typically described by a leading highway engineer as "the smoothest pavement I have ever seen."

### COMPLETE DATA ON REQUEST

Hydraulic control, quick-crown-change and width adjustability (hydraulic self-widening where desired), diagonally adjustable finishing screed and many other valuable Jaeger features are described in latest catalog. Ask your Jaeger distributor—or write us.



smoothness of their finished slab. On single-course work, here diagrammed, one spreader operator does the spreading, strike off and first finishing pass with oscillating screed — all in the one

pass. Only one more machine operator is needed behind. He controls both the Jaeger tandem screed finisher and the Jaeger finisher-float. This last machine can be towed by, and operated from,

**THE JAEGER MACHINE CO., 800 Dublin Avenue, Columbus 16, Ohio**  
**JAEGER MACHINE CO. of CANADA, LTD., ST. THOMAS, ONTARIO**



# MASSEY-FERGUSON'S CLAIM OF "CAN DO!" is backed by "HAVE DONE" PERFORMANCE



## SEE HOW **INSTANT REVERSE** CAN MAKE YOU MONEY

You check with operators who own a Massey-Ferguson 204 Industrial Tractor. Let them tell you what it "CAN DO" for you.

You'll find this rugged unit is the only tractor in the 40-h. p. class equipped with Instant Reverse and torque converter so all you have to do to change directions of travel is touch your toe to either the forward or reverse foot pedal. With acceleration built in each pedal away you go without shifting or clutching. You simply pre-select the one of four different gear ranges that best suits your job, and you can work as fast in reverse as you do going forward. This lets you back out of congested areas...maneuver in close

quarters...and shorten the cycle time between load and dump.

There is no question that this is the greatest time-saving, fuel-economizing, and most maneuverable tractor in its class. A full range of attachments—including the famous Massey-Ferguson Loader, Backhoe, Scarifier-Scraper—are available so you can handle any job you tackle with power-matched equipment.

What Massey-Ferguson has done for others in the profit column it "CAN DO" for you. Let your Massey-Ferguson Dealer show you the full line of M-F Industrial Equipment today!

**Why Wait? — Set a Date — We'll Demonstrate!**



**MASSEY-FERGUSON INDUSTRIAL DIVISION**

Block 1000 South West St.,

Wichita 13, Kansas

*Producing Sizeable Power for the "Sensational 60's"*

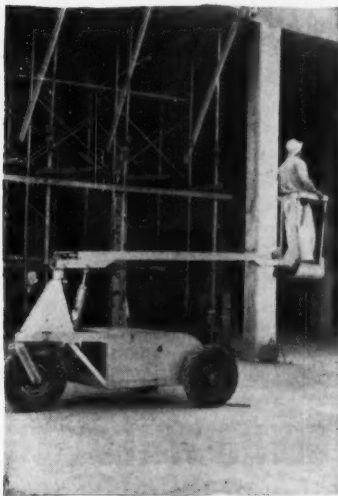
MF60-19



ing units save 4 to 5 hr in positioning time alone. They require little adjustment.

A track-mounted traveler sets the 15-ft-high, 41-ft-long side-wall and roof-slab form unit over a previously poured 2-ft, 7½-in.-thick concrete invert. A winch moves the traveler. Concrete is poured for the 2½-ft-thick walls and the 3½-ft-thick ceiling slab in about 7 hr.

Forms are stripped 48 hrs after the pour. The side panels swing away from the wall easily, rotating about a hinge at the top corner of the form. Scoring wire welded to the skin plates leaves a rough bonding surface for setting ceramic tiles.



### Tower Reaches Top

Crews of Worsham Construction, Inc. extend their reach in building a three-story warehouse at West Haven, Conn., with an assist from a self-propelled elevator rig.

Workmen reach the top of the 23-ft-high walls on the platform of a Pitman Travel Tower. When the hydraulically operated tower is raised to its maximum height of 16 ft, the workman on the platform can install wall form ties or strip column capital forms. Mounted on a three-wheel, rubber-tired tractor, the rig is powered by a gasoline engine that also powers the hydraulic pump for the elevating mechanism. Controls are at the operator's platform at the end of the tower.

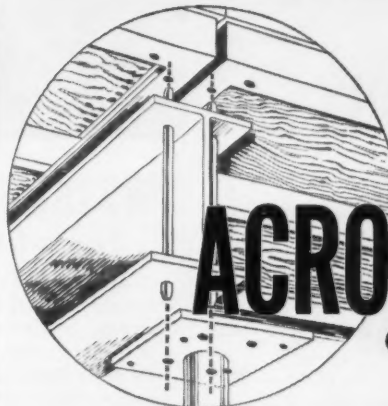
## NOW-AIR TOOLS WHEN NEEDED



Worthington's Guaranteed Availability Plan keeps a full complement of tools on the job even if some are in the shop for checkup or repair. All you do is: 1) bring your hand-held Blue Brute air tool to your Worthington distributor. 2) While it's in his shop he will lend you another tool.

See your nearest Worthington distributor for complete details about the Guaranteed Availability Plan. Worthington Corporation, Holyoke, Massachusetts.

60-16



## ACROW V FORM

Complete slab-forming

SYSTEM gives you

**POSITIVE...AUTOMATIC...  
INSTANTANEOUS ALIGNMENT**

Send for  
Literature

**and they save as much as  
45% ON LABOR COSTS**



ACROW Denver, Inc., 1035 So. Huron St.  
Denver, Colorado • Phone SP 7-5486

SYSTEM consists of only three basic parts: an ACROW SHORE, a support beam and a form panel. All three can be quickly assembled by any inexperienced workman. Nothing can possibly go wrong in the assembly; there is nothing that can come loose.

ACROW V FORM gives you speed, rigidity and safety in one combination. They are made in standard component sizes for every type of slab construction...Get all the facts.

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# The CLEVELAND JS-30

WITH INSTANT LATERAL

**DIGGING WHEEL  
POWER-SHIFTS 5 FEET  
FROM SIDE TO SIDE**

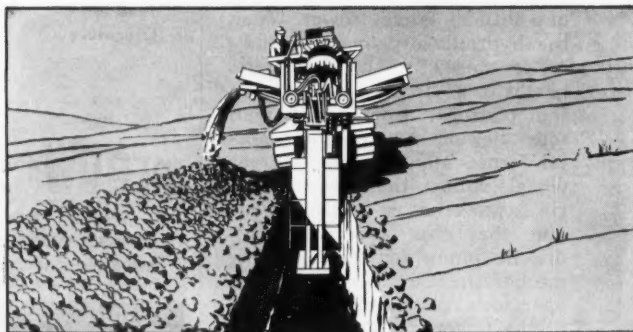
**Digs trench behind  
either crawler or  
anywhere within  
its 6-foot width**

Lateral shifting of the JS-30's wheel, up to 2½ feet to either side of center, is done hydraulically under lever control at operator's location, so trench can be dug at any point within 6-foot-wide path made by the crawler. Edge of 24-inch trench can be dug 5 inches outside either track, permitting trench to be flush with parallel pavement, curbs, sidewalks, etc. With wheel tilted, trench can be dug virtually flush with trees, poles, fences and other above-ground obstructions.



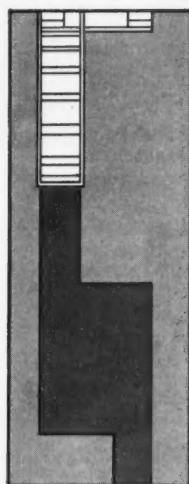
## **INSTANT DIGGING WHEEL TILT cuts blocking, cribbing costs**

Hydraulic power-tilting of the JS-30's digging wheel to either side of vertical — a total tilting range of 14° — under lever control at the operator location, permits digging vertical trench on side slopes and in similar conditions with one crawler track on a higher level than the other. This eliminates the necessity of blocking, cribbing, etc. in such conditions. Power-tilt adds 7 inches to the outside cut of the digging wheel. This in combination with lateral power-shift permits digging trench virtually flush with above-ground obstructions.



# —a trencher of amazing utility

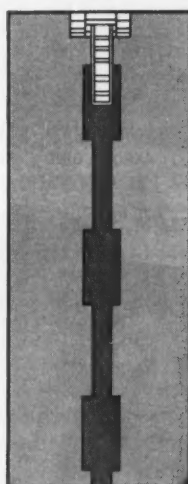
## 'DIGGING WHEEL POSITIONING



### EXCAVATES BELLHOLES

**saves on  
trench width**

Power-shifting and power-tilting of the JS-30's digging wheel are especially valuable in cutting trench to extra width required at pipe joints. This permits digging trench to narrow width except where bellholes are required. By utilizing power-shift the JS-30 can dig up to 6 ft. wide, down to 5½ ft. deep — reduces slower hoe-work to clean-up, etc.



### PLUS THESE OUTSTANDING CLEVELAND FEATURES

- Every operation is automatic, completely controlled at operator seat.
- Hydraulic crumbing shoe raised and lowered under lever control from operator seat.
- Automatic conveyor shifting for side-to-side positioning.
- V conveyor for faster, higher, more efficient spoil discharge.
- Pulley-enclosed, dual conveyor drives, with instant belt speed and direction control.
- 33 positive non-slipping digging speed-and-power combinations.
- World's finest trencher crawlers, 1000-hour-lubricated.

**DIGGING CAPACITY:** 5 ranges, from 11" to 24" wide, to 5½' deep; to 6' wide with power-shift.

**POWER:** 370 cu. in. diesel—59 HP @ 1250 RPM.

**WIDTH:** 6' over crawlers; 7' 11" over conveyor.

**HEIGHT:** 8' 2" digging; 9' 5" loading.

**LENGTH:** 27' 3".

Pioneer of the



Modern Trencher

## The CLEVELAND TRENCHER Co.

20100 St. Clair Avenue

Cleveland 17, Ohio



**TOUGHEST RIMS...**

**THAT SAVE BIG TIRES!**

STRESS-TESTED FIRESTONE RIMS REDUCE TIRE DOWNTIME FOR MORE UNINTERRUPTED HOURS OF SERVICE

Here's the strongest earthmover rim in the world—the Firestone Perma-Tite! Designed for uniform strength distribution, it has no high stress points to cause failures. Firestone's Perma-Tite design delivers new full-tire support, reduces sidewall flexing, runs cooler for longest tire wear. It insures a permanent air seal. Fusion welding in Firestone's exclusive balanced weld design provides equal penetration for maximum strength. Specially protected against corrosion, they're interchangeable with all earthmover rims and parts. For any information or aid in adapting Firestone Perma-Tite earthmover rims to present or new equipment, write, wire or call Firestone Techni-Service, Department 28-4, Firestone Steel Products Co., Akron 1, Ohio.

**Firestone**

**STEEL PRODUCTS COMPANY**  
AKRON 1, OHIO / INTEGRITY, QUALITY, ACCURACY, DEPENDABILITY







**LARGEST REINFORCING BAR ORDER IN BETHLEHEM'S HISTORY**—Typical scene during the construction of the 4-mile long twin conduits at the gigantic Niagara Power Project. When completed, the project will add 1,950,000 kw to the power facilities of New York State. Some 60,000 tons of Bethlehem reinforcing bars were required for the project, being built under the direction of the Power Authority of the State of New York. Contractors on this portion of the project: Balf-Savin-Winkelman, and Gull-De Felice.

## *Bethlehem Steel Products for Concreting*

Reinforcing Bars, plain and fabricated . . . Bar Supports . . . Nails and Tie Wire for formwork . . . Bars and Strand for prestressed concrete . . . Tie-Rods . . . Standard and Special Fasteners.

Bethlehem reinforcing bars come in a complete range of sizes, including the giants, 14S and 18S. They're all made of new-billet steel. This is your guarantee of composition, mechanical, and physical properties. When bundles of Bethlehem bars arrive at the job, certified mill test reports, matched with heat numbers, can identify your bars with the specific heat tapped from our open-hearth furnaces.





**PAVING THE PENN-CAN**—New entry in Pennsylvania's vast superhighway system—and part of the Interstate System—is the Penn-Can, stretching from Stroudsburg north to the New York State line. Lycoming Construction Co., contractor on this section near New Milford, Pa., used a long list of Bethlehem road steels, including reinforcing steel, bar mats, dowel units, wire rope, beam and cable guard rail with steel posts.

## *The most complete line of paving steels...*

When you are in the market for highway steels, remember that besides the list of paving steels at the right, Bethlehem supplies steels for right-of-way work: hollow and solid drill steel, special analysis steels for construction equipment, culvert sheets, wire rope, etc. Bethlehem steel products for the finished highway include fabricated plates and shapes for bridges and underpasses, guard rails and posts, bridge rails, fence, and fence posts.

We've had years of experience in supplying steel for highways. We understand the road builder's problems. Our people are more than glad to talk over your job with you at any time.

# **BETHLEHEM STEEL**



**JET-AGE AIRPORT**—At Dulles International Airport, Chantilly, Va., runways 10,000 to 11,500 ft long, 150 ft wide, and 12 to 15 in. thick are laid to accommodate jet aircraft. Like any heavy-duty roadbed, the concrete is interlaced with reinforcing steel for strength and with dowel units for expansion, contraction, and weight transferral between slabs. Contractor: C. J. Langenfelder & Son, Inc.



**MISSILE BASE**—Future launching pad for one of the Atlas missile launching bases under construction near Spokane, Wash. The project manager for MacDonald-Patti-Scott-Leavell, the general contractor, commented that each pad seems to be more steel than concrete, a construction necessary to withstand the impact of an Atlas launching.

**HERE'S A PARTIAL LIST:**

Road-form stakes • bar mats • hinged bar mats • reinforcing for continuous paving • welded fabric • dowel units and hook-bolt center-joint dowels • trapezoidal keyways • dowels for longitudinal contraction and expansion joints • expansion hook bolts for pavement widening • center strips and pins.





**PRIEST RAPIDS DAM**—Vast tonnages of reinforcing steel are needed for huge projects like this \$98,000,000 dam on the Columbia River in Washington. Here, too, steel products such as steel sheet piling are extensively used plus wire rope, and others. Merritt-Chapman & Scott Corp. is building the project for the Grant County Public Utility District.

## Do YOU Have These Publications ?

Take a look at this list of Bethlehem publications on highway products, concrete construction, and allied fields. Just use the coupon below. The numbers in front of the publications also appear in the coupon. Circle those you'd like to receive.

1. Dowel Units
2. The Welding of Concrete Reinforcing Bars
3. Perfect Vision Bridge Railing
4. Beam Guard Rail
5. Non-Highway Uses of Beam Guard Rail
6. Cable Guard Rail
7. Steel Bridge Flooring
8. Yieldable Arches for Mine Roof Support
9. Rock Bolts
10. H-Piles
11. Sheet Piling
12. Abrasion-Resisting Steels
13. Rolled-Steel Curb Facing
14. Hollow Drill Steel
15. Slings and Fittings
16. Solving Drainage Problems (steel culverts)
17. Wire Rope for Construction
18. Structural Shapes
19. High-Strength Bolts
20. Stress-Relieved Strand for Prestressed Concrete
21. Form Stakes

PUBLICATIONS DEPARTMENT  
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.  
Export Distributor: Bethlehem Steel Export Corporation

# BETHLEHEM STEEL





# 830 ft. every 9 hrs.

## in hard formation with REICHdrill

*... we've never even come close to this  
with any competing rig*

Construction job performance like this is standard with REICHdrill. Why? Because:

- ...all-hydraulic top-drive rotary provides infinitely variable speed of drill rotation — the right speed for every formation.
- ...direct-drive to drill stem saves power loss.
- ...all air used to drill and clean hole.
- ...no complicated transmission, no rotary table.
- ...no kelly bar — in and out of the hole faster.
- ...instant safety torque release protects all drive components.

REICHdrill has built a reputation for keeping maintenance costs low; footage records high.

And these additional REICHdrill features help set drilling records: masts incline for angle drillings; CP heavy-duty compressors assure plenty of air to meet all demands; fast-acting, ram-type hydraulic leveling jacks permit use of most rig weight for down pressure; CP "Air-Blast" Bits for extra footage in toughest formations.

*For further information write:*



# REICHdrill

1439 ASH STREET, TERRE HAUTE, INDIANA

Division: CHICAGO PNEUMATIC TOOL CO.



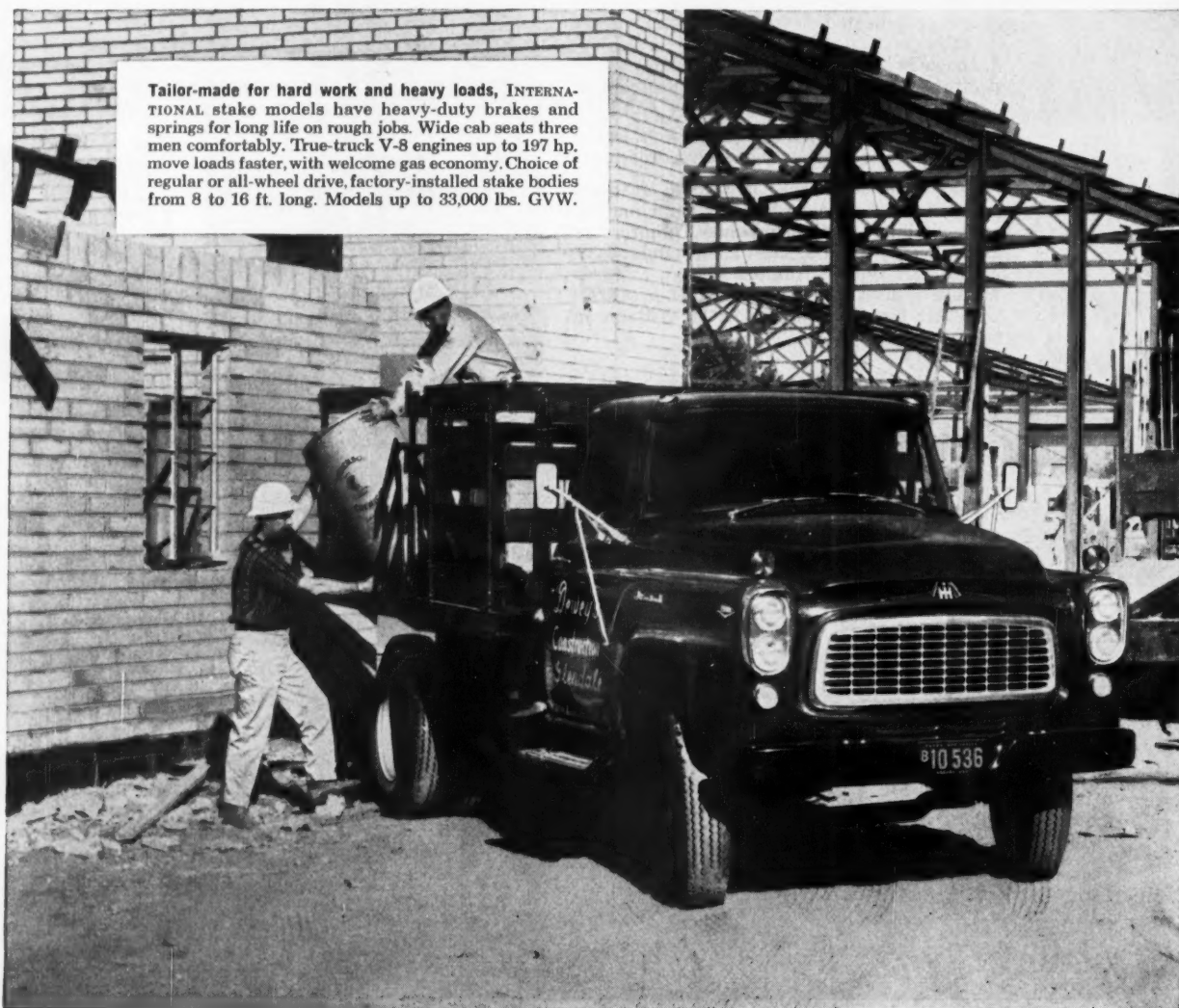
*T-650 truck-mounted  
REICHdrill  
in operation  
on construction  
work. Hole  
size: to 7 1/4";  
down pressure:  
30,000 pounds.  
Other models  
available,  
truck or  
crawler  
mounted, with  
hole size to  
16 inches,  
down pressure  
to 90,000  
pounds.*





Six-passenger capacity, plus pickup body—the Travelette® takes work crews and their equipment all in one trip. Comfortable, full-width rear seat has curbside door for easy in and out. Chassis and 6-ft.

standard or Bonus-Load pickup body are factory matched and factory mounted. Travelette models handle gross loads up to 8,800 lbs. You get "dual versatility" for one price. Optional four-wheel drive.



Tailor-made for hard work and heavy loads, INTERNATIONAL stake models have heavy-duty brakes and springs for long life on rough jobs. Wide cab seats three men comfortably. True-truck V-8 engines up to 197 hp. move loads faster, with welcome gas economy. Choice of regular or all-wheel drive, factory-installed stake bodies from 8 to 16 ft. long. Models up to 33,000 lbs. GVW.



"Hotshot" small loads, big men around the job in an INTERNATIONAL pickup. Comfortable cab has 5 ft. wide seat, extra headroom. Choice of standard all-steel bodies (shown) or optional Bonus-Load bodies

up to 8½-ft. long. 266 cu. in. V-8 engine gives outstanding gas mileage. Sweep-Around windshield has no "knee-skinning" doorway projections. Four-wheel drive available, too.

# INTERNATIONAL HAS WHAT IT TAKES

*in pickups...in stakes...  
in any truck you need!*

Here are three reasons for you to think of and look into INTERNATIONAL when you want light and medium-duty trucks that do many jobs well over many years.

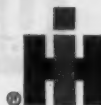
They're three from dozens of INTERNATIONAL models designed to take more people, more payloads, more punishment. In these trucks — as in all INTERNATIONALS—every component is a truck component, built for long life and low-cost maintenance. True-truck V-8 engines are standard power, with famous INTERNATIONAL 6's optional. You can't beat 'em for ruggedness, solid comfort, easy handling — and for dollar value.

Next time you're in the market for trucks, take a look at everything INTERNATIONAL has to offer. See your INTERNATIONAL Truck Dealer or Branch.

## INTERNATIONAL® TRUCKS

WORLD'S MOST  
COMPLETE LINE

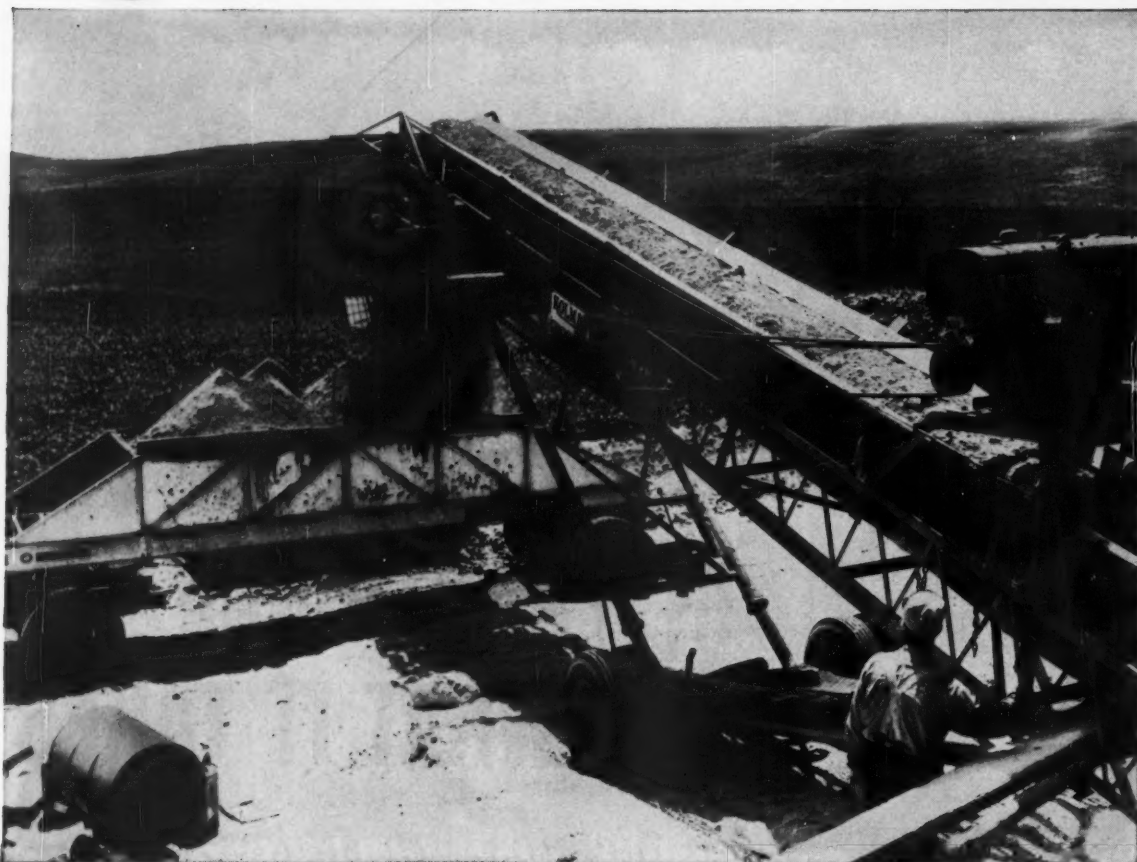
International Harvester Company, Chicago • Motor Trucks • Crawler Tractors  
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors







CONVEYOR BELTS



Stockpiled aggregates at crushing plant being conveyed into trucks via "U.S." Belt.

## "No maintenance, no repairs, no downtime,"

SAYS CO-OWNER OF BIG CRUSHING PLANT

Mr. John Weelborg (of Weelborg Bros., Dell Rapids, S. D.) is co-owner of a firm engaged in crushing aggregates and in chip-surfacing roads.

The rock (dug from nearby pit) is bulldozed into stockpiles. 5-ply belts in widths of 36", 30", 24", 20" then carry the rock to the crusher for processing. These same belts carry crushed rock and sand to trucks for transportation to road-building sites.

"In the 20 months since these belts were installed," says Mr. Weelborg, "there has been no maintenance, no repairs, no downtime. *We couldn't ask for better belts.*"

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

This installation was handled by "U. S." Distributor W. S. Hott, Minneapolis



Mechanical Goods Division

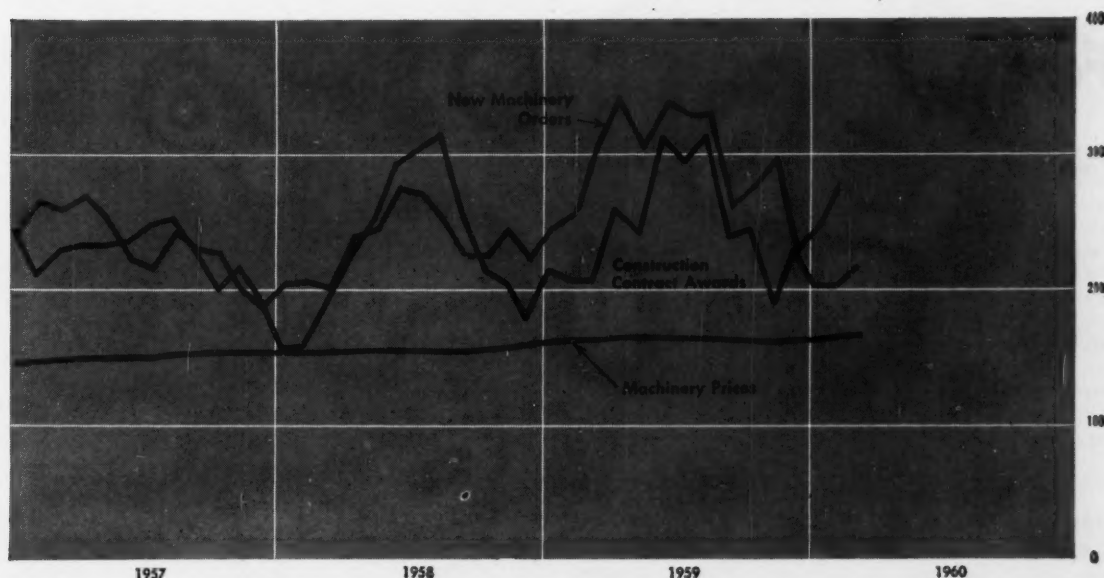
# United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N. Y.

In Canada: Dominion Rubber Company, Ltd.

# Trends in the Machinery Market



## Price Index

	FEBRUARY 1960	MONTH AGO	YEAR AGO	% CHANGE 1959-1960
All Types of Equipment .....	173.9	173.6	171.4	+ 1.4
Cranes; Draglines, Shovels .....	171.0	171.2	168.7	+ 1.9
Shovel, 1/2 cu yd .....	166.2	165.0	156.2	+ 6.4
Shovel, 3/4 cu yd .....	174.7	173.9	173.3	+ 0.8
Shovel, 1-1 1/2 cu yd .....	187.0	187.0	184.6	+ 1.3
Shovel, 2-2 1/2 cu yd .....	166.4	164.7	159.5	+ 4.7
Shovel, 3-3 1/2 cu yd .....	167.8	167.8	167.8	0
Shovel, 6 cu yd .....	195.0	195.0	188.2	+ 3.6
Crane, truck mounted .....	168.2	168.2	169.4	+ 0.8
Crane, tractor mounted .....	135.1	135.1	135.1	0
Bucket, clam shell .....	157.5	157.5	157.5	0
Bucket, dragline .....	169.3	169.3	169.3	0
Scrapers and Graders .....	165.8	165.8	163.8	+ 1.2
Scraper, 4 Wheel, 8-10.5 cu yd .....	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd .....	156.8	156.8	156.8	0
Scraper, 2 Wheel, 15-19.5 cu yd (a) .....	124.9	124.9	123.7	+ 0.9
Grader, heavy duty .....	172.6	172.6	171.1	+ 0.8
Grader, light & medium .....	171.1	171.1	166.1	+ 3.0
Tractors (non-farm, incl industrial) .....	189.9	189.9	187.8	+ 1.1
Wheel type, off-highway (a) .....	129.0	129.0	128.2	+ 0.6
Crawler type, 50-74 dhp .....	195.8	195.8	188.8	+ 2.0
79-99 dhp .....	200.2	200.2	196.4	+ 1.9
100-154 dhp .....	192.4	192.4	191.3	+ 0.5
155-200 dhp .....	103.3	203.3	201.4	+ 0.9
Machinery, Tractor Mounted .....	169.0	169.0	168.8	+ 0.2
Dozer, cable controlled .....	154.4	154.4	154.4	0
Dozer, hydraulic controlled .....	186.6	186.6	186.6	0
Cable power control unit .....	151.4	151.4	151.4	0
Loader, tractor shovel .....	162.5	162.5	161.5	+ 0.6
Specialized Machinery .....	158.0	158.2	153.3	+ 3.0
Ditcher .....	150.1	150.1	156.6	- 4.2
Roller, tandem .....	231.0	220.2	198.6	+ 16.3
Roller, 3 wheel .....	178.7	174.9	170.2	+ 4.9
Ripper and rooter .....	150.5	150.5	150.5	0
Dewatering pump, 10 M gph .....	110.3	110.3	110.6	- 0.3
Dewatering pump, 90 M gph .....	151.5	151.0	148.3	+ 2.1
Portable Air Compressors .....	167.5	167.5	159.5	+ 5.0
Contractor's Air Tools .....	181.6	181.6	181.6	0
Mixers, Pavers, Spreaders .....	158.6	158.2	155.0	+ 1.7
Mixer, portable, 11 cu ft .....	166.8	166.8	164.1	+ 1.6
Mixer, portable, 16 cu ft .....	172.7	172.7	168.6	+ 2.4
Mixer, truck, 6 cu yd .....	132.7	132.7	131.1	+ 2.5
Mixer, paving, 34 cu ft .....	193.5	193.5	191.6	+ 2.4
Concrete finisher & spreader .....	199.7	196.7	191.5	+ 4.2
Bituminous distributor .....	126.2	126.2	122.3	+ 3.1
Bituminous spreader .....	170.2	170.2	170.2	0
Bituminous paver .....	163.2	163.2	162.6	+ 0.3
Off-Highway Trucks, Wagons (b) .....	101.1	101.1	100.6	0
Contractors off-highway truck (b) .....	101.1	101.1	100.6	0
Trailer dump wagon (b) .....	101.4	101.4	101.4	0

• (a) January 1955=100 • (b) January, 1958=100  
BLS Primary Market Price Indexes, U. S. Department of Labor, 1947-49=100

## Some Makers Cut Equipment Prices

Construction equipment price developments last month gave contractors something to cheer about.

Cheerful notes are sounded by dealers in Bucyrus-Erie power shovels. Changes and modifications in four of the larger capacity machines have permitted price slashes of 15% to 17% fob plant. Models affected are in the 2 1/2-yd to 5-yd bucket range.

Mack Truck Company reduced the price tag on its big LYSW off-highway dump truck by almost 4%. The reduction is made possible by design changes that permit a price cut while at the same time increasing payload. Design changes and re-rating of certain other Mack models may be completed and new prices announced sometime this month.

However, most types of contractor's equipment are holding steady, notably crawler tractors and scrapers. Whether or not the price cuts announced by Bucyrus-Erie and Mack Truck will eventually lead to reductions in competitive machines remains to be seen. But it may be significant that few increases have come along so far this year and many of these have been "selective" rather than across the board.

On February 15, the Bureau of Labor Statistics index of manufacturers' list prices moved up a bit to 173.9, based on average prices during 1947-49 as 100. This is a new all-time high, and it's 1.4% higher than in February, 1959.

Tandem roller prices, up 4.9%, and 3-wheel roller prices, up 2.2%, joined with slight increases in the BLS indexes for power shovel prices to push the February average up. Also contributing to the February rise was a 1.5% increase in the BLS price index for concrete finishers and spreaders.

## Federal Airport Aid Increased

CONSTRUCTION totaling \$105 million should result from allocations just set by the Federal Aviation Agency for airports during fiscal 1961 which starts July 1, 1960. These total \$58.8 million of which \$6.1 million is for land. FAA allocates money only when local sponsor funds are assured on a 50-50 matching basis and only for facilities directly related to the take-off, flying, and landing of aircraft. These federal funds are an increase of 3% over last year.

### Mostly for Paving

Paving of runways, taxiways, and aprons accounts for almost 77% of the total allocations earmarked for these classes of improvements:

#### Federal Funds

Runway construction	\$24,078,141
Taxiways and aprons	21,161,409
Lighting	2,963,375
Marking	71,961
Control towers	2,026,428
Other buildings	696,774
Roads	6,270
Clearing and obstruction removal	1,495,350
Fencing	192,564
Land	6,143,831

Allocations for individual cities or airports which exceed \$200,000 are shown in the accompanying table. They account for almost 73% of the total and are well distributed throughout all regions of the U.S. including Alaska and Hawaii. Puerto Rico gets \$758,500.

### Major Airport Aid Allocations

(By the Federal Aviation Agency for Fiscal 1961)

Location		Federal Funds	Location		Federal Funds
Total allocations .....		\$58,835,103	Middle West .....		\$6,270,785
Major allocations			Ohio .....		955,500
(\$200,000 or more) .....		42,695,549	Dayton .....		242,350
New England		\$3,061,950	Ind. Evansville .....		221,350
Vt. Springfield .....		224,000	Indianapolis .....		1,333,000
Mass. Boston .....		916,207	Lafayette .....		551,760
Lawrence .....		274,239	Alton-East Alton .....		217,000
Worcester .....		1,000,000	Chicago .....		751,650
Conn. Danielson .....		264,400	Wis. Milwaukee .....		242,450
Windsor Locks .....		383,104	Mich. Detroit .....		240,000
Middle Atlantic		\$8,439,878	Grand Rapids .....		874,000
N.Y. Elmira .....		219,300	Lansing .....		366,225
New York			Muskegon .....		275,500
(La Guardia) .....		252,000	Miss. to Rockies		\$6,927,464
New York			Minn. Minneapolis .....		1,302,635
(Idlewild) .....		773,500	Mo. St. Louis .....		810,000
Syracuse .....		1,323,000	Okla. Oklahoma City		
N.J. Newark .....		1,546,000	(Tulakes) .....		339,048
Pa. Allentown .....		422,000	Oklahoma City		
Franklin .....		508,092	(Will Rogers) .....		524,218
Hazleton .....		323,800	Tulsa .....		963,896
Philadelphia .....		1,122,000	Austin .....		334,900
Pittsburgh .....		984,310	Borger .....		245,000
Reading .....		239,126	Fort Worth .....		907,500
Washington .....		356,000	Great Falls .....		250,267
Md. Baltimore .....		370,750	Mont. Denver .....		1,250,000
South		\$8,014,542	Colo. Denver .....		1,250,000
Va. Hot Springs .....		523,925	Far West		\$9,610,180
Lynchburg .....		320,000	Utah Salt Lake City .....		800,460
W. Va. Clarksburg .....		280,900	Ariz. Phoenix .....		619,078
N. Car. Greensboro-High			Tucson .....		501,806
Point .....		234,280	Nev. Reno .....		213,125
Ga. Atlanta .....		390,000	Wash. Seattle .....		830,268
Fla. Tampa .....		686,000	Alaska Anchorage .....		208,500
Ala. Birmingham .....		334,000	Fairbanks .....		1,584,325
Mobile .....		538,200	Juneau .....		221,250
Miss. Jackson .....		365,474	Calif. Bakersfield .....		448,926
La. Alexandria .....		362,000	Long Beach .....		258,768
New Orleans			Los Angeles .....		1,336,170
(Moisant) .....		500,000	Oakland .....		1,027,020
New Orleans			Oxnard .....		272,008
(New Orleans) .....		371,515	San Jose .....		313,476
Ky. Covington .....		485,465	Hawaii Honolulu .....		975,000
Lexington .....		208,539	Puerto Rico		
Tenn. Knoxville .....		402,500	San Juan .....		758,500
Memphis .....		1,394,937			
Nashville .....		233,407			
Rockwood .....		384,400			

## State Roadbuilding Budgets Set to Rise

A 26.3% rise in highway and bridge contracts in 1960 to \$4.2 billion is the overall outlook based on budgets from 49 states and the District of Columbia. But the picture is spotty—a variety of ups, some downs.

The biggest increases are set for Michigan, from \$131.5 million in 1959 to \$275 million in 1960, and Pennsylvania from

\$62.2 million last year to \$175 million this year.

Middle West state budgets total \$906.1 million, an 18% rise for 1960 with all returns in. In spite of Michigan's big increase and a modest one for Ohio, this area drops below the 49-state average because Indiana, Illinois, and Wisconsin each have scheduled a decrease in 1960 contracts.

The 13.7% increase—to \$946.6 million—in the states between the Mississippi and the Rockies also represents complete returns. Increases are scheduled by Iowa, Missouri, Nebraska, Kansas, Oklahoma, Montana, Wyoming, Colorado, and New Mexico; decreases are set for Minnesota, Arkansas, North and South Dakota, Texas.

Of the programs in so far, New York leads with the biggest 1960

*continued on page 47*





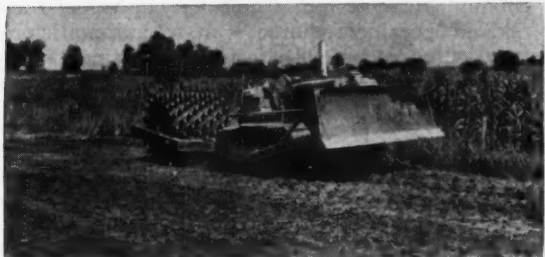
**SCRAPER-LOADING** using a Caterpillar No. 60 Scraper is a job the new D7 handles with ease. New Turbocharged Cat Diesel delivers 140 HP. Greater torque rise increases its lugging ability 80 per cent.

# TRIPLE PLAY BY NEW D7

*Three different tasks and 20 per cent more production*



**DOZING** approaches to Eleven Point Bridge, the D7 aerates heavy, wet earth before compacting and adding more fill. New dry-type air cleaner, lifetime lubricated rollers and new transmission lubricating system make low-cost operation normal for a Cat-built Tractor.



**COMPACTING** is a job the D7 Series D takes in stride. Final drive gears have been strengthened on the new model and big job-proved features have been retained...such as the exclusive oil clutch which delivers as many as 2000 service hours without adjustment.

All-around performance—dozing, scraping, compacting—makes the D7 Series D an even better investment than the efficient machine it replaced. On this bridge construction job over the Eleven Point River at Dalton, Ark., the approaches had to be cleared and the road widened. Through heavy, wet sand and clay, the new D7 more than lived up to the expectations of Superintendent Farris Whited, Jr., of the E. E. Barber Construction Company, Fort Smith, Ark.: "The new D7 Series D is the best tractor I have ever operated. It can do at least 20 per cent more work than the former model. It loads the scraper fast and hauls and pulls good. In dozing it can really move the dirt, too!"

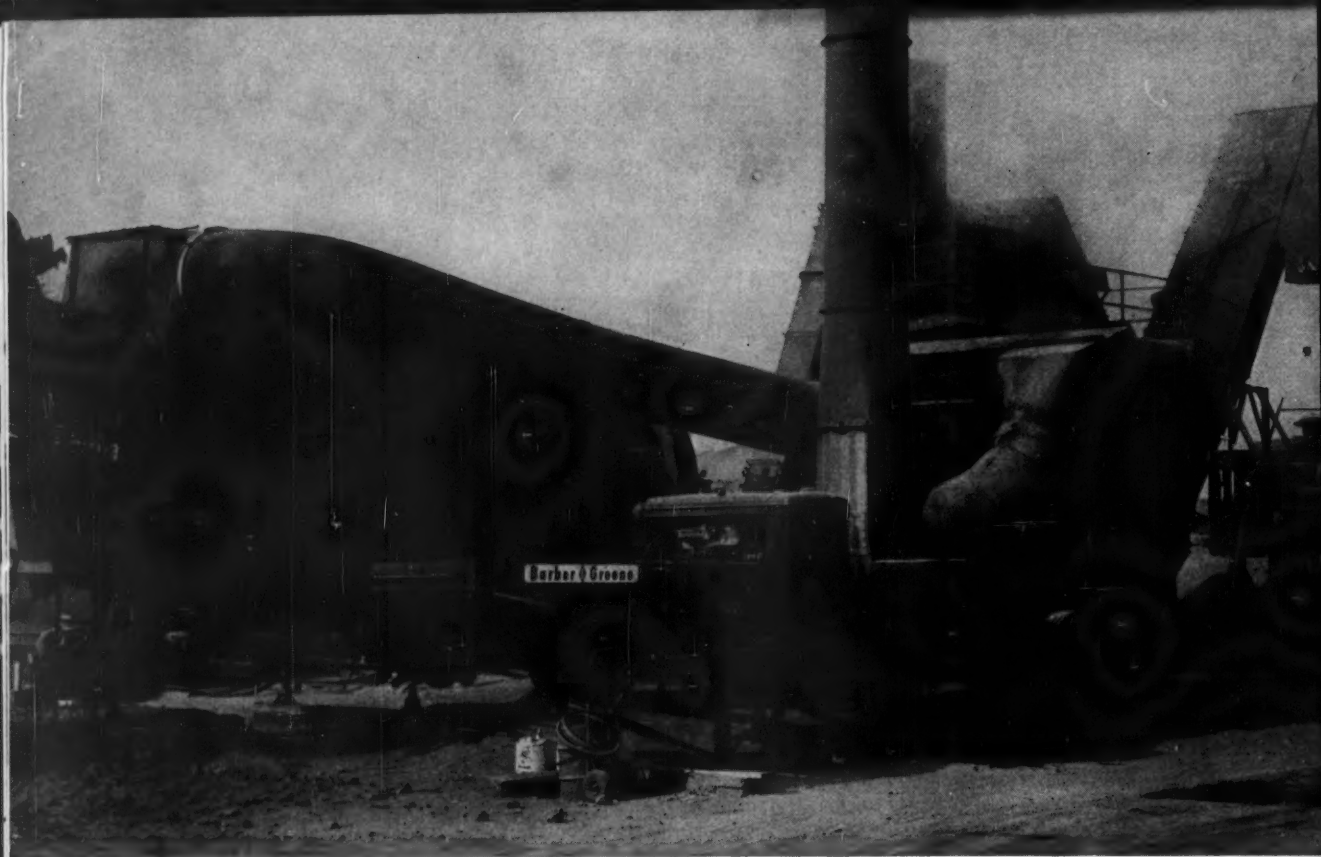
Ask your Caterpillar Dealer—who sells, services and maintains a complete parts inventory for a full line of equipment—to demonstrate a new D7. You supply the job and name the date. He'll supply the machine and proof of performance. Call him today.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

## CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**WANTED—  
THE HARD WORK**



# CONTINUOUS MIX 20 YEAR CUSTOMER

**San Ore Construction Co., has completed 14 jobs with both types of Barber-Greene plants since mid-1956 purchase**

Lloyd Miller, partner in San Ore Const. Co., McPherson, Kansas, reports: "During the past 20 years, we have owned six Barber-Greene plants and eight Barber-Greene finishers.

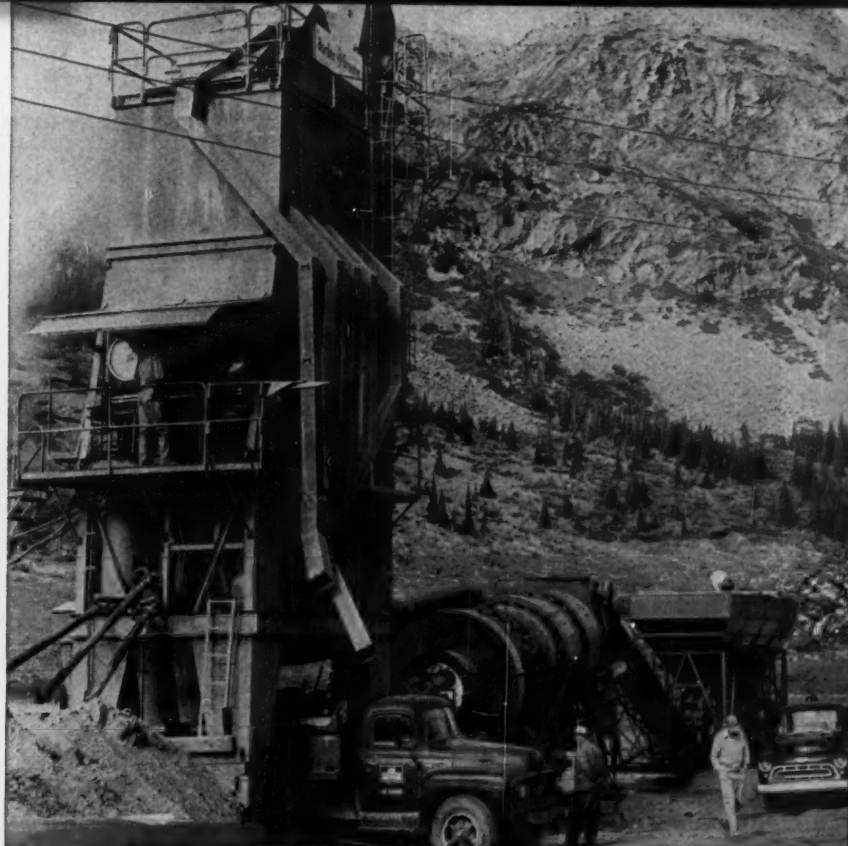
"We like both our Barber-Greene Continuous and BatchOmatic plants, especially the low maintenance. And our BatchOmatic has operated 100% automatic since the day we got it. Both plants have produced nearly 1,000,000 tons on 14 jobs in widely scattered locations."

Before buying your new asphalt plant, check with the leading authority in your area—your nearby Barber-Greene distributor. He can offer you by far the greatest choice of size and type of: continuous mixers, batch towers, dryers, dust collectors, wet collectors, gradation units, cold feed units, and complete materials handling systems including conveyors, elevators and feeders.

**CONTINUOUS PLANT ADVANTAGES**—You'll get these benefits with any of four Barber-Greene Con-

tinuous plants: • greatest production per dollar of investment; • up to 10% initial savings; • sustained high production at lowest per ton cost; • up to 10% lower operating costs; • up to 10% lower maintenance per ton; • higher resale value; • less skilled operators required; • pre-set automatic proportioning accuracy; • fastest setup time; • buy only needed components; and • move only needed components for your next job.

**BATCHOMATIC BENEFITS**—And with any BatchOmatic plant you get these new features and improvements; • push-button control from automatic to manual operation for quick mix changes; • most rugged and reliable automatic control system cuts maintenance in half; • exclusive Dyna Mix pugmill gives fastest mixing time; • fastest discharge; • up to 10% more tonnage with advanced cycling principle; • over 25% greater sand screening capacity; • plant completely pre-wired; • completely hydraulic operation; and • tower comes in complete self-contained sections.

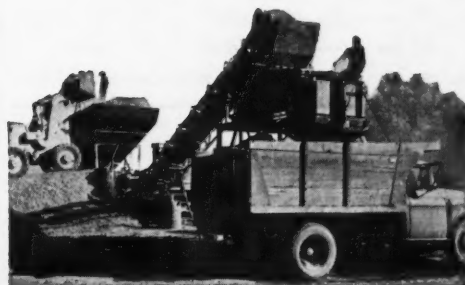


Having previously owned four Barber-Greene asphalt plants in 16 years, San Ore Const. Co., in 1956, purchased their 848 Continuous and 896 Batchomatic plants which are now nearing their 1,000,000th ton of mix.

# OR BATCHOMATIC? PROFITS FROM BOTH



**STABILIZATION PLANTS FOR EVERY NEED.** The new Stabilization Plant, left, hydraulically erects itself in two minutes after being towed to the job on its own pneumatic tires. This is but one of four models in Barber-Greene's No. 1 stabilization plant line that offer a production range from 200 to more than 600 tons of lowest cost mix hourly. All models meet any state's specs and are backed by years of experience in continuous material handling and control—your assurance of highest tonnage, lowest maintenance. Self-erecting Model 828, left, also available in portable and stationary models. Smaller Model 824 produces from 80 to over 200 tons hourly.



*World's No. 1 manufacturer of asphalt paving equipment.*

Representatives in Principal Cities of the World

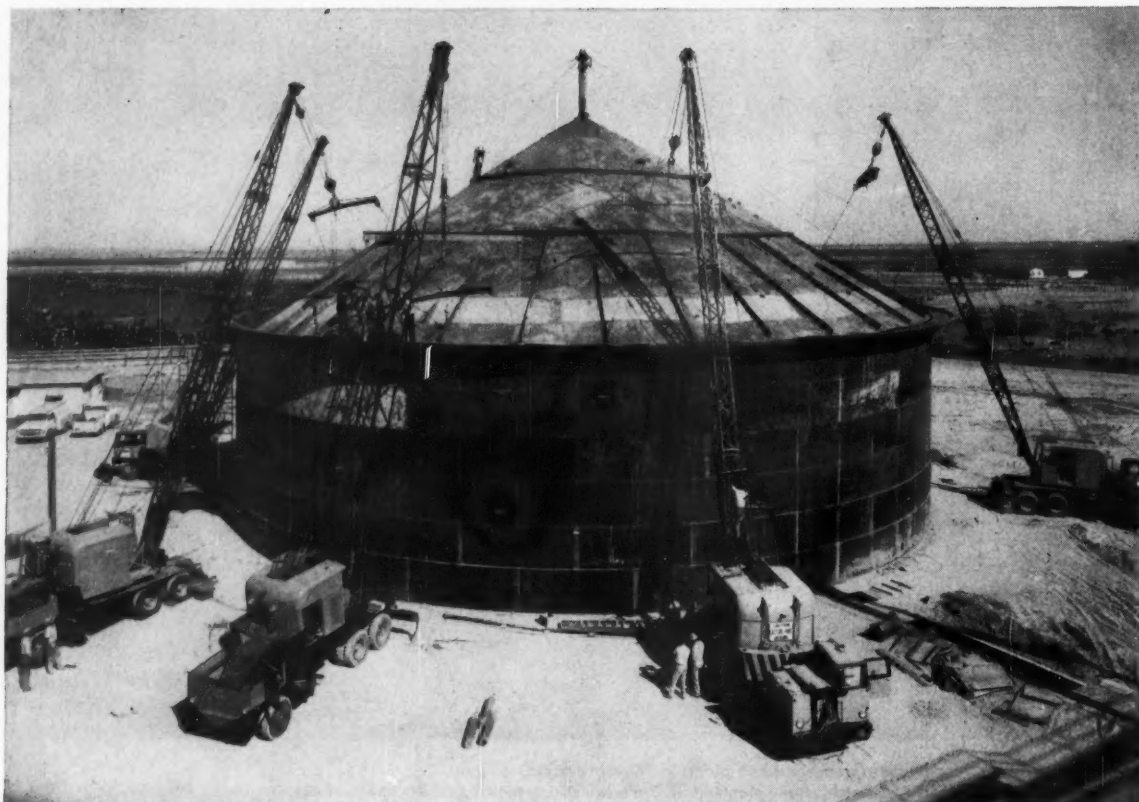
## Barber-Greene

Main Office and Plant AURORA, ILLINOIS, U. S. A.  
Plants in DeKalb, Illinois, Detroit, Canada, England, Brazil, Australia



CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT





Five contractors position a 60-ton steel roof—all five use Lorain Moto-Cranes for the job.

## LEAVE IT TO LORAIN . . . to build the first rubber-tire crane 41 years ago . . . to develop more sizes and introduce more innovations than any other manufacturer

**First with crane carriers** especially built for crane service to provide unlimited speed (up to 45 mph) mobility . . . to do a job no commercial motor truck chassis can do.

**First with Square-Tubular-Chord booms** that are lighter, stronger . . . increase lifting capacities and provide greater reaches for clamshell and dragline service. Available up to 200-ft., plus 40-ft. tip.

**First with "Shear-Ball" connection** that provides smooth, steady swings . . . reduces downtime for maintenance and frequent lubrication common to roller type designs. "Shear-Ball" is warranted for 10 years.

**First with "Power-Set"® outriggers** that are set in less than one minute. Four independently controlled, hydraulically operated outrigger beams automatically adjust to uneven ground or for tight quarter work.

For details, see your Lorain distributor.

**THE THEW SHOVEL COMPANY, LORAIN, OHIO**

### Wide range of models available

Model No.	Crane Capacity	Shovel Capacity	Carrier	Clam	Drag	Hoe
TC-107	8-ton	3/8-yd.	6x4, 6x6	x	x	x
TC-110	10-ton	1/2-yd.	6x4, 6x6	x	x	x
MC-218	18-ton	3/4-yd.	6x4	x	x	x
MC-425	25-ton	1-yd.	6x4	x	x	x
MC-430	30-ton	1-yd.	8x4	x	x	x
MC-530	35-ton	1-yd.	6x4, 8x4	x	x	x
MC-530W	35-ton	1 1/4-yd.	8x4	x	x	x
MC-760	65-ton	—	8x4	x	—	—
MC-875	80-ton	—	6x4	x	—	—

# LORAIN® ON THE MOVE

contract budget—\$300 million. Ohio is second with \$295 million; California is third at \$280 million; Michigan is fourth at \$275 million; and Texas is fifth with \$253 million. For 1959, Ohio was high with \$282.2 million under contract, just ahead of the Texas total of \$281.5. New York was third with \$226 million.

Far West states report budgets totaling \$574.1 million, a 41.7% gain over 1959. This total includes Alaska and Hawaii.

New England, with \$291.5 millions, shows a 34% increase thanks to a big program in Massachusetts.

The South scores \$913.4 billion for a 22.3% increase. For the first time, schedules for five years into the future are available for some states based on present policies and outlook for federal aid.

More details will be available next month on the distribution of these contracts between interstate, ABC and 100% state financed systems.

Federal highway allotments

for 1961 are expected to be less onerous than those for fiscal 1960. Not only will there be \$200 million more money to divide among the states (the total is \$2.9 billion) but rationing commitments probably will be at a uniform level of 25% per quarter. (The 1960 schedule is about 22%, 11%, 33%, and 33%.) States will be free to commit their allocations without restrictions to either interstate or ABC highways.

### More Builders Go Broke

More building contractors are failing this year than last. A 38% jump in bankruptcies in the first two months probably reflects last year's rugged competition for new jobs which led an increasing number of contractors to bid into the "red."

This rise to 153 in building contractor failures in the first two months, as reported by Dun & Bradstreet, is particularly significant because it reverses the downtrend last year—the first decline in five years.

By contrast, there are 13% fewer failures so far this year in other contractors — those doing highways, bridges, dams, waterworks, sewerage, and other heavy construction. Only 27 of these contractors went broke in the first two months.

Failures are also down slightly this year for special trade subcontractors, off 1% to 208. However, all of the 1959-1960 decline occurred in January. February brought a sharp increase in failures as compared with a year ago and nearly wiped out all of the January improvement.

Failures this year indicate that more large builders are going under and that there's a big increase in failures of large trade subs. This is because the average liabilities of failing companies are up sharply. For building contractors they've climbed 15% to an average of \$68,100 per failure. And for subs they've soared 62% to an average of \$51,400.

Contracts Awarded, page 48

## HERE'S SPRAGUE & HENWOOD'S TIME & MONEY SAVER

### EXAMPLE:

Have you ever found, after a concrete floor was finished that sleeves had been set in the wrong place, or that they had moved during the pouring? Have you ever found that you needed additional holes for which no sleeves had been set? If you have then you know there should be an easier way to spot and make these holes—

**HERE IT IS:** Sleeves could be eliminated, and floors poured solid. Then the required holes can be spotted accurately, and drilled cleanly . . . smoothly . . . quickly and in the required diameter with Sprague & Henwood Masonry diamond bits. Re-inforced concrete presents no problem.

Other ways to save time and money are to use Sprague & Henwood Masonry diamond bits in drilling holes in glass . . . ceramic tile . . . brick . . . stone . . . concrete . . . asphaltic concrete, plus many other hard or brittle materials. Sprague & Henwood manufactures three types of Masonry diamond bits: Resettable—Throw-Away—Impregnated.

Write today for more information on how you can save money . . . save time . . . and in the final result make more money for yourself or your firm.

Look for our emblem . . . It's your Seal of Quality

**SPRAGUE & HENWOOD, Inc.**



**221 WEST OLIVE STREET  
SCRANTON, PENNSYLVANIA**



## SIMPLICITY in the Heart of the Modern Diesel Engine

**Simple**—Only 8" long, 3 1/4" wide, 5 1/2" high . . . weighs less than 10 pounds . . . fewer parts to service, fewer adjustments to make.

**Versatile**—Because of accessories that can be built in or added at low cost taking up no, or very little, valuable engine block space.

**Economical**—Initial cost is less, costs less to service, saves money because of its dependable service.

Write for guides to better fuel injection. One features the pump, the other an efficient, economical filter.

HMS

**ROOSA MASTER**



HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.  
Division of Standard Screw Company

THE BEST IN SIGHT IS **BERGER**



**BERGER Transit** teamed up with  
**F. H. McGRAW & CO.**  
on billion-dollar  
atomic energy project

C. L. BERGER & SONS, INC.  
53 Williams St., Boston 19, Massachusetts

## SOME BIG CONTRACT AWARDS OF THE MONTH

**United States Steel Corp.**, New York, N. Y. Fabricate and erect cables and suspenders for the Narrows Bridge at the entrance to New York Harbor. Triborough Bridge & Tunnel Authority, Administration Building, Randalls Island, New York 35, N. Y. \$56,-896,390.

**McCloskey & Co.**, Philadelphia, Pa. Erect superstructure for new U.S. House of Representatives office building in Washington, D.C. Office of the Architect, U.S. Capitol, Washington, D.C. \$50,793,-000.

**H. B. Zachry Co.**, San Antonio, Tex., and **O. R. Burden Construction Corp.**, Tulsa, Okla. A joint venture to construct a 370-mi, 24-in. gas line from Angleton, Tex., to Fort Worth, Tex. Old Ocean Fuel Co., Fort Worth, Tex. \$24,250,000.

**F. H. McGraw & Co.**, Hartford, Conn. Erect two office buildings and a garage at the site of the East Side Redevelopment Project in Hartford, Conn. Constitution Plaza, Inc., 111 Talcott St., Hartford, Conn. \$20,000,000.

**Utah - Manhattan - Sundt Corp.**, San Francisco, Calif. A joint venture to construct missile launching facilities at nine locations in the vicinity of Schilling Air Force Base, Salina, Kan. Corps of Engineers, 1800 Federal Office Building, Kansas City 6, Mo. \$17,209,000.

**Cahill Bros., Inc.**, San Francisco, Calif. Erect an 18-story hotel building in San Francisco, Calif. Hilton Hotels Corp., 401 7th Ave., New York, N. Y. \$15,000,000.

**P. J. Carlin Construction Co.** and **Atlas Tile & Marble Works, Inc.**, both of New York City. A joint venture to erect a court house and federal office building in Brooklyn, N.Y. General Services Administration, 250 Hudson St., New York 13, NY. \$13,683,000.

**Diamond Construction Co.**, Savannah, Ga. Construct the second underwater section of the Norfolk-Portsmouth Tunnel at Norfolk, Va. Elizabeth River Tunnel



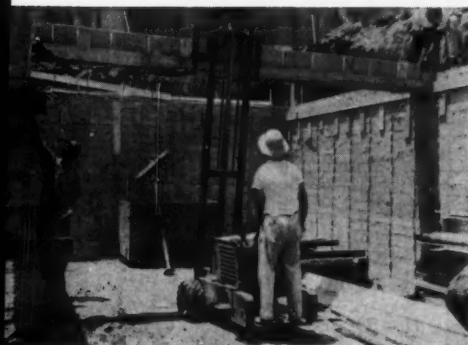
# Whiteman

## POWER BUGGIES®

Concrete, bricks, blocks, pipe, mortar, lumber, forms, millwork . . . there's a Whiteman Power Buggy to haul every type of material faster, better, cheaper. 8 models with various inter-

changeable body types. All are sturdy, tireless workers, priced to quickly pay for themselves. Job-proved in rugged use for over 14 years. Call your Whiteman dealer or send coupon now.

### a model for every job!



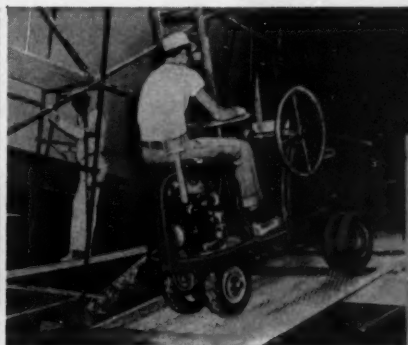
#### FORK LIFT

Here shown lifting a form into place. Moves palletized block, brick, mortar, etc. with ease. Lifts to 7' 10". 1000 pound capacity. Bucket body is interchangeable.



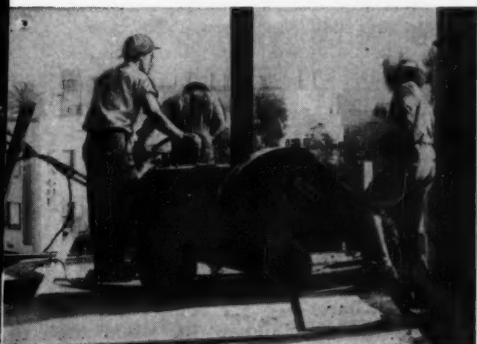
#### FLAT BED

Hauls lumber, forms, pipe, millwork and countless other materials. 44" x 48" or 44" x 60" bed. Stakes or side boards optional. Bucket body is interchangeable.



#### DUMP BUCKET

Fastest, cheapest way to place concrete. Carries 13 cubic feet. Speeds up to 16 mph. Climbs 20° grades. Controlled, accurate pour. Standard of the industry.



#### WALK-OR-RIDE

Efficient way to place concrete and haul bulk materials. Operator walks or rides. Travels narrow runways, thru 31" doors. Flat bed interchangeable.



#### PALLET LIFT

For fast, efficient hauling of palletized mortar, block, brick, bags, etc., where high lift is not required. Saves handling and man hours.



#### UTILITY

Does a multitude of hauling jobs. Large 44" x 60" flat bed. 54" wheelbase. Drives from front end. Also available in 38" wheelbase for towing. (shown)

# Whiteman

THE LEADER  
IN CONCRETE  
EQUIPMENT

WHITEMAN MANUFACTURING CO. Dept. C  
13020 Pierce St., Pacoima, California

Please send prices, catalogs and name of distributor for:

- |  |                                       |
|--|---------------------------------------|
| <input type="checkbox"/> Power Buggies               | <input type="checkbox"/> Vibrators    |
| <input type="checkbox"/> Screeding Machines          | <input type="checkbox"/> Truck Mixers |
| <input type="checkbox"/> Floating-Finishing Machines |                                       |

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Leading contractors use *Ramset* to

CONTROL  
FASTENING  
COSTS



Ramset's speed, mobility, versatility and efficiency assure lowest possible fastening cost on every construction job. Ramset powder-actuated fastening eliminates tedious drilling and plugging... is up to 15 times faster than other methods. Just a pull of the trigger sets a drive pin, threaded stud or eye pin permanently in steel or concrete. Ramset's proven quality is your assurance of consistent performance, time after time.

For quick, economical fastening, even in the toughest spots, you can depend on Ramset tools, fasteners and charges. Your Ramset dealer will be glad to demonstrate, right on your job! Call him (under "Tools" in Yellow Pages) or write us direct for cost-cutting advice on your fastening requirements.

INSIST ON THE

RED TIP FASTENER WITH THE



**Ramset® Fastening System**  
OLIN MATHIESON • WINCHESTER-WESTERN DIV. • 201-D WINCHESTER AVE. • NEW HAVEN 4, CONN.

## CONTRACTS AWARDED . . .

*continued*

Commission, City Hall, Norfolk, Va. \$11,631,669.

**Paul Hardeman, Inc.,** Stanton, Calif. Construct propellant loading systems and interconnecting piping at seven Atlas missile sites in the continental U. S. Corps of Engineers, Box 1660, Fort Worth, Tex. \$10,888,178.

**Contracting Engineers Co.,** Los Angeles, Calif. Erect a shopping center on a 60-acre site in Fremont, Calif. The Hapsmith Co., 9808 Wilshire Blvd., Beverly Hills, Calif. \$10,000,000.

**John F. Beasley Construction Co.,** Dallas, Tex. Erect superstructure for the Balboa Bridge over the Panama Canal in the Canal Zone. Panama Canal Co., Balboa Heights, Canal Zone. \$9,119,000.

**Ross & Pash,** Hewitt Harbor, N.Y. Erect 450 housing units in Jersey City, N.J. Newark Bay Homes, Box D, Greenville St., Jersey City, N.J. \$7,500,000.

**Perini Ltd.,** Toronto, Ont., **Johnson-Kiewit Subway Corp.** and **Peter Kiewit Sons' of Canada,** Vancouver, B.C. A joint venture to construct 2,900 lin ft of subway structure and an adjacent underground parking garage. Toronto Transit Comm., 1900 Yonge St., Toronto, Ont. \$7,431,506.

**Depot Construction Co.,** New York, N.Y. Construct a 24-story, 260,000-sq-ft office building in New York City. Hanover-Beaver Corp., 20 E. 46th St., New York 17, N.Y. \$7,000,000.

**Sherman Olsen, Inc.,** Chicago, Ill. Construct a 10-story office building in Bloomington, Ill. Illinois Agriculture Association, 43 E. Ohio St., Chicago, Ill. \$6,000,000.

**Catalytic Construction Co.,** Philadelphia, Pa. Construct a chemical plant in Houston, Tex. Ethyll Corp., 3910 W. Alabama St., Houston, Tex. \$6,000,000.

**A. L. Jackson Co.,** Chicago, Ill. Erect a 20-story office building addition in Chicago, Ill. Continental Casualty & Assurance Co., 310 S. Michigan Ave., Chicago 4, Ill. \$5,500,000.

*continued on page 53*

## SPECIAL REPORT TO CATERPILLAR OWNERS:



# OPTIONAL TRACK GROUPS

up-date D9 or D8 Tractors for longer undercarriage wear

Now, two types of track groups are available for older model D9 and D8 Tractors . . . regular and optional, allowing you to tailor your undercarriage parts to meet job conditions.

Lighter tones at top of etched cutaways show depth of special hardness in wear zones.



**REGULAR** track parts are made from durable steel. They're heavy-duty, long-lived, special-hardened to resist wear.

**OPTIONAL** track parts are equivalent to those used on current production model tractors. The links and shoes are made from Caterpillar's new alloy steel that is hardened much *deeper* than regular steel. Link rails are hardened twice as deep. Shoe grousers are hardened 400% deeper. The new alloy steel also provides greater strength with more impact resistance.

**MORE METAL WHERE IT COUNTS.** Optional components are king size. Every part is beefed up and made bigger with more *hardened* steel in wear areas.

**BORALLOY "HUNTING TOOTH" SPROCKETS** are another new feature of the optional groups. Every other tooth is used in one revolution, alternate teeth being picked up the next revolution. This alternation means that teeth contact the bushings only *half as many times* as do regular sprocket teeth. More important are the teeth themselves—they're *machined* for exact fit with the big bushings. This greatly extends bushing life.



### COMPARE regular and optional track components:

	Pitch	Pins O.D.	Bushings O.D.	Track shoe bolts and nuts	Sprocket
<b>D8</b>	regular 8 inches	1 3/4 inches	2 3/4 inches	3/4 inch	14 tooth
	optional 9 inches	2 inches	3 inches	7/8 inch	25 tooth
<b>D9</b>	regular 9 inches	2 inches	3 3/16 inches	7/8 inch	28 tooth
	optional 10 1/4 inches	2 1/4 inches	3 3/8 inches	1 inch	25 tooth

**HOW MUCH MORE LIFE?** Variation in the length of track life occurs because components have different wear rates under various soil and job conditions. In sand, pins and bushings wear faster. In rock, shoes and links wear faster.

**ON-THE-JOB TESTS** confirm that the new optional track components are giving up to 40% more life than the regular parts. On many applications, you can expect even greater wear life.

**CORRECT TRACK GROUP SELECTION IS IMPORTANT.** It depends on job types and conditions. Let your Caterpillar Dealer analyze your track needs. He'll recommend the correct components to help you get maximum life at the most reasonable investment. Call him soon.

### SERVICE TIP:

**FREE!** Handy reference for ordering track options. "New Options for D9 and D8 Tractors" includes part numbers that are used to adapt to your older models. Pick up a copy at your Caterpillar Dealer's.

## CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Caterpillar Tractor Co., General Offices  
Peoria, Ill., U.S.A.





LYNCH ASPHALT COMPANY, PAXTON, ILLINOIS

## "Cities Service Lubrication Engineer Helped My Business Get Started"

"How could we afford a lubrication engineer?" says W. P. Lynch, who has been employed in the asphalt business for fourteen years and now runs his own less-than-one-year-old company. "Of course we couldn't! So we found a company that would give us the services of a lubrication engineer. It relieves me of an important problem as we're starting out here."

From previous experience, Lynch was acquainted with Cities Service and their lubrication engineers. Upon forming his own firm, Lynch turned to Cities Service and Lubrication Engineer, Jeff Combs. Combs undertook the task of solving Lynch's lubrication problems. Combs answered all questions about the use and application of petroleum products. He assisted in the selection and purchase of lubrication equipment. Among the Cities Service products recommended by Combs and used by Lynch: C-300 Motor Oil for all automotive equipment, Trojan Greases and Oils for general lubrication and gears, DC-950 as a "hot oil" for heat transfer in the asphalt plant.

To find out how the professional assistance of a Cities Service Lubrication Engineer can help in the operation of your business, call your nearest Cities Service Office. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



Portable hot mix asphalt plant with 120 tons per hour capacity is owned by Lynch. Other equipment includes trucks, rollers, compactors, graders.



Employees are shown here using company's asphalt paving machine to pave church parking lot. Road and driveway paving are also done by Lynch.

**CITIES SERVICE**  
QUALITY PETROLEUM PRODUCTS

**CONTRACTS AWARDED . . .**  
*continued*

**Edward M. Fleming Construction Co.,** Miami, Fla. Construct a Criminal Courts Building in Miami, Fla. Board of Commissioners, Dade County Courthouse, Miami, Fla. \$5,365,501.

**Mellwin Construction Co., Inc.,** Denver, Colo. Construct a hotel with resort facilities including ski lift, golf course, ice skating rink, swimming pool, and tennis courts in Buford, Colo. All Seasons Club, Buford, Colo. \$5,000,000.

**Henry C. Beck Co.,** Atlanta, Ga. Construct a laboratory building at Oak Ridge National Laboratory, Oak Ridge, Tenn. U. S. Atomic Energy Commission. Box E, Oak Ridge, Tenn. \$4,871,000.

**Ralph T. Viola and M. & T. Concrete, Inc.,** Oxnard, Calif. A joint venture to erect two test project buildings and additions to instrumentation building at Point Mugu, Calif. Public Works Office, 11th Naval Dist., 1220 Pacific Highway, San Diego, Calif. \$4,740,000.

**Nomellini Construction Co.,** Stockton, Calif. and **Fruin-Colnon Contracting Co.,** Burlingame, Calif. A joint venture to construct 354 housing units in the vicinity of Candlestick Park, San Francisco, Calif. \$4,689,000.

**Corbetta Construction Co., Inc.,** New York, N.Y. Construct the structural framework for a terminal building at Dulles International Airport, Chantilly, Va. Federal Aviation Agency, 16th and Constitution Aves., Washington, D.C. \$4,432,000.

**Hunzinger Construction Co.,** Milwaukee, Wis. Erect a 21-story Medical Center in Milwaukee, Wis. Juneautown Corp., 1205 N. Van Buren St., Milwaukee, Wis. \$4,250,000.

**Tom E. Norcross,** Long Beach, Calif. Construct the Palos Verdes High School in Los Angeles, Calif. Board of Education, 1426 E. San Pedro St., Los Angeles, Calif. \$3,332,778.

**Darien & Armstrong, Inc.,** Detroit, Mich. Erect a warehouse in Hudson, Ohio. General Motors Corp., Hudson, Ohio. \$3,000,000.

# OWEN

## the Greatest Name in Buckets All Over the World

Wherever you go, wherever you see excavating or handling of materials . . . there you will find one or more OWEN Clamshell Buckets on the job. Faith in their performance, confidence in their sturdy construction, and complete assurance in their ability to complete contracts satisfactorily and "on time" . . . these are the reasons that powerful, rugged OWEN Clamshell Buckets dot construction jobs all over the globe.

You'll get more from an OWEN in every way — Longer Life, Larger Loads, More Economical Operation. From drawing board to finished product, OWEN lives up to its great name in every way. Put the real worker on the end of the boom! — get a Great OWEN Clamshell Bucket without delay.



### OWEN MATERIAL HANDLING BUCKETS

OWEN'S new center line reeving principle, now incorporated in a completely redesigned line of material handling buckets, is one factor that increases cable life of these buckets up to 75%. A full line now available from 1/4 cu. yd. up to 10 cubic yards.

### OWEN GRAPPLES

OWEN'S patented independent tine action 4-prong grapple has proven itself invaluable in land clearing operations. Its independent tine action guarantees positive contact and tremendous gripping power on each of the four tines, no matter how irregular the shape of the object may be.

Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.



**The OWEN BUCKET Co.**  
BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES: New York • Philadelphia • Chicago  
Berkeley, Calif. • Fort Lauderdale, Fla.

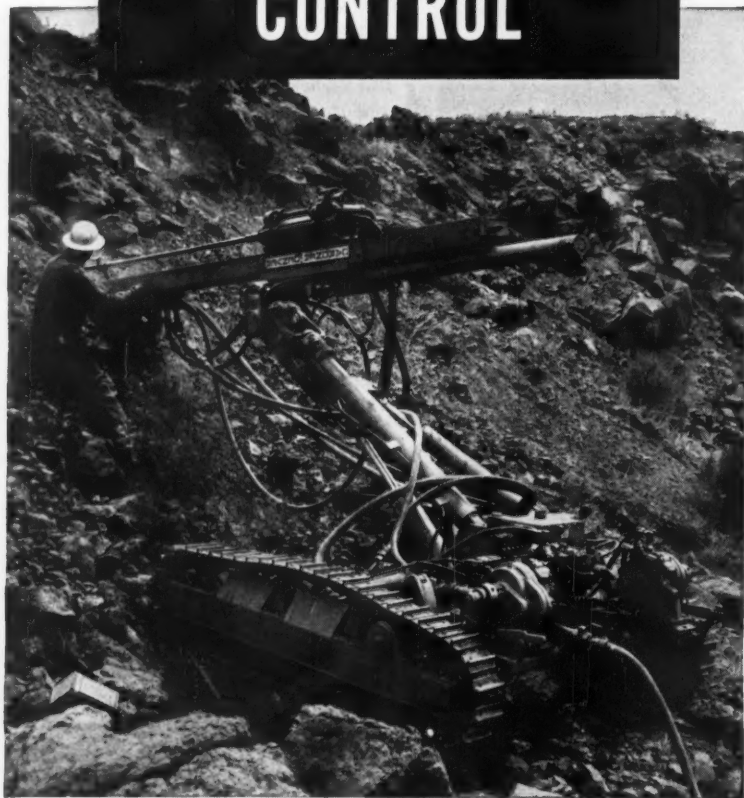
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# GARDNER-DENVER OPENS A NEW ERA IN PERCUSSION DRILLING



## No other rock drill compares with THE NEW GARDNER-DENVER

### ABSOLUTE CONTROL



No other rock drill gives your operator absolute and independent control of these vital rock drill functions:

**Rotation without impact**—Efficient gear motor supplies powerful rotation in either direction, even when drill is not impacting. Three rotation speeds at the flick of a control. Neutral position stops rotation.



**Impact without rotation**—Separate control provides impact action without rotation. Percussion can be varied from light to heavy blows, and can be used to loosen couplings or stuck steel.

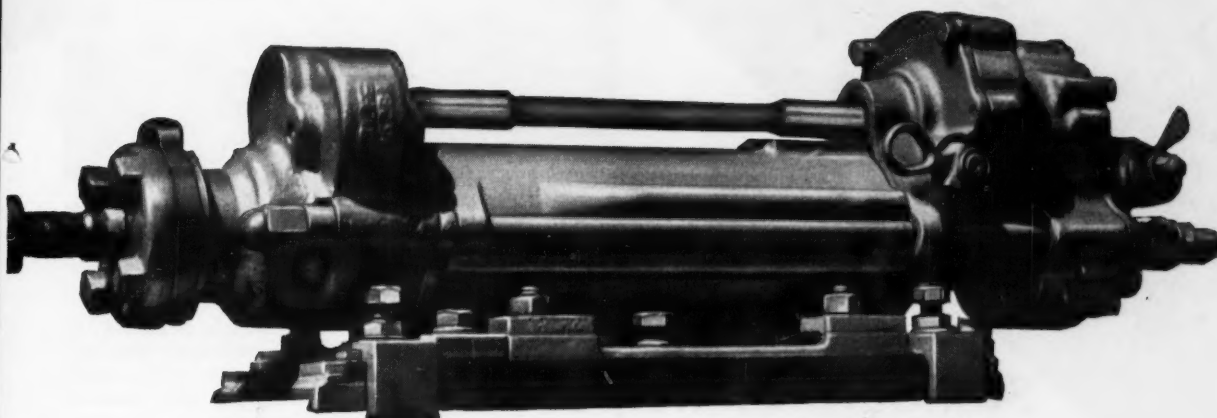


**Impact and rotation**—This unique drill provides light percussion and rapid rotation for drilling in soft rock . . . or heavy impact and slow rotation for hard rock.



**HIGH-POWERED DRILLING TEAM**—The new PR123 drill on the famed Gardner-Denver Swing-Boom "Air Trac"® makes an unbeatable rock drilling combination.





# POWER ROTATION MODEL PR123

## UP TO 30% FASTER PENETRATION

The new PR123 is the only rock drill which uses *all* hammer energy directly for percussion. There's no rotational drag on the piston hammer. Every blow is sharp and solid. Results: faster hard rock drilling than ever before. Depth of hole does not affect drilling speed as it does with a conventional rifle-bar-rotated drill. You can drill deeper holes with the PR123.

## SELECTIVE DRILLING

Now your operator can line up the right combination of rotation speed, impact force, feed pressure and hole blowing for fast drilling in any type of rock. No other rock drill provides absolute, independent and instantaneous control of impact and rotation. Drilling action can be changed as soon as the bit enters a new rock formation.

## NO ROTATION PARTS IN CYLINDER

The PR123 has no rifle bar, no ratchet ring, no pawls or other vulnerable internal rotation parts, and thus eliminates the most frequent causes of rock drill breakdown and maintenance. Instead, rotation is supplied by a long-wearing gear motor which is efficiently lubricated by the air line oiler. A torsion bar absorbs rotational shock between shank and motor.

## POWER COUPLING AND UNCOUPLING

Independent rotation control is a real time-saver when drilling with sectional rods and couplings. Rotation without impact permits power coupling of threaded rods without damage to the threads. Reverse rotation speeds uncoupling when coming out of the hole. Independent power rotation also helps free stuck steel.

**PROVEN DESIGN**—The new PR123 uses the same cylinder and automatic valve parts as the popular Gardner-Denver DH123. Renewable chuck driver liners for all sectional shanks. Piston diameter: 4½". Length: 38½". Weight, less mounting: 290 pounds.



EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

# GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



Multi-million dollar picture. Here is part of Western's equipment lined up for inspection at Oahe Dam. Photo shows 86 trucks, 23 bulldozers and crawler pieces and 9 scrapers.

## **2 ways Standard Oil helps Western Contracting Corporation save on Oahe Dam job**

*In eight years on project, 10 million gallons of diesel fuel and gasoline have been delivered on time and when needed*

**Saving No. 1** F. L. "Red" Napple, Standard Oil staff engineer, and Standard Oil agent Bob Friman have been serving Western on the Oahe Dam project since the first dirt was moved in 1952. This means continuity of service that can be invaluable to a contractor. Red Napple has an engineering degree plus more than 13 years' experience in just this kind of work. Western thus has the equivalent of another engineer helping them. Napple is located at Aberdeen and Friman at Pierre, both only a few miles from the job. Western works around the clock. So does Standard. Bob Friman and his men make deliveries 24 hours a day, winter and summer. Western never has equipment down while waiting for deliveries of fuels, lubricants or greases.

**Saving No. 2** Western uses only quality products — Standard's Diesel Fuel, STANDARD RED CROWN



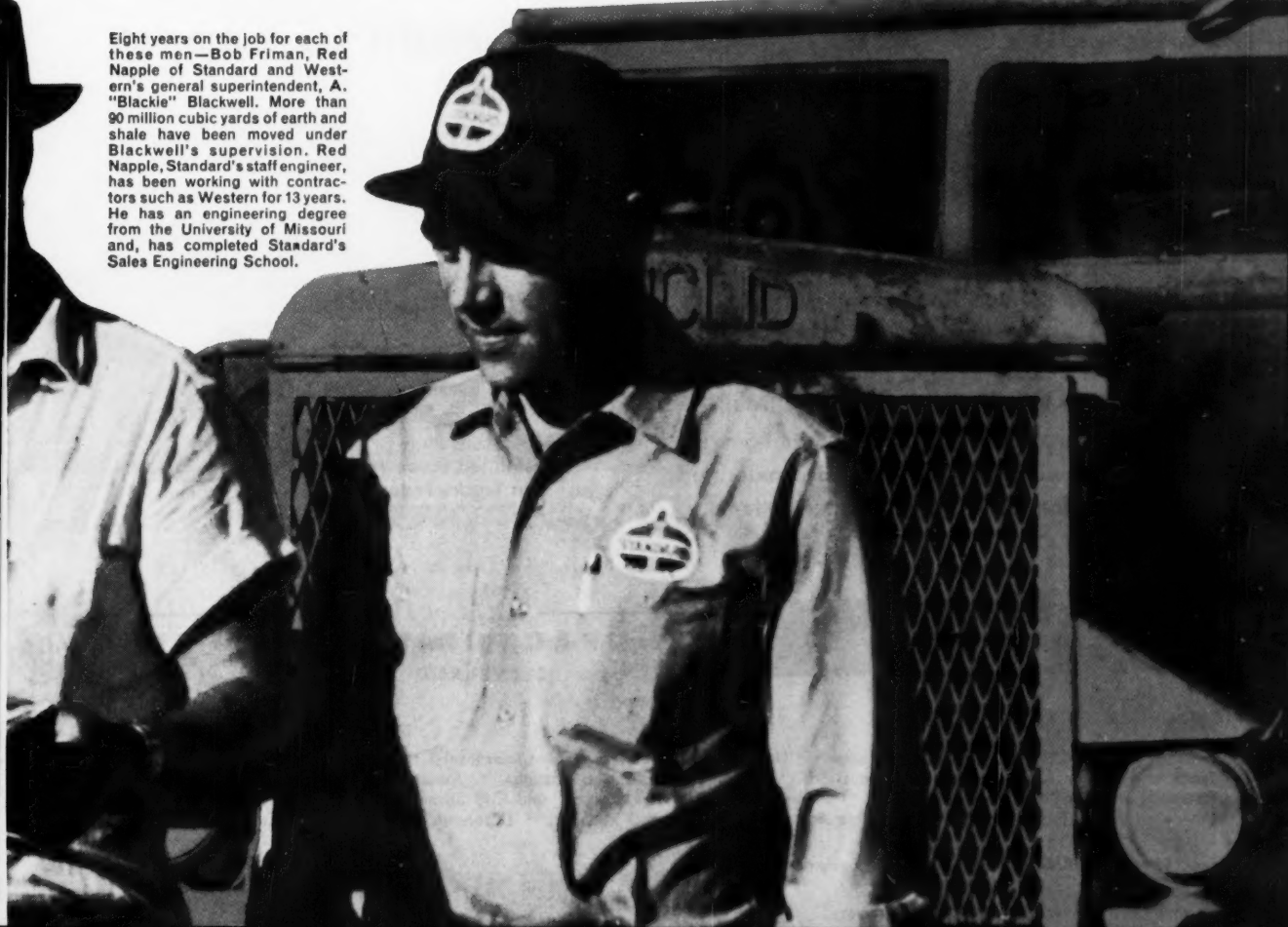
Gasoline, STANOLUBE Motor Oils, AMOCO Lithium Multi-Purpose Grease. With these quality products, equipment is never out of service because of a motor oil or grease failure. Quality products give top level performance over a wider range of conditions. Fewer products do more jobs. This means less inventory, less chance for misapplication, less paper work, less servicing of equipment is needed. Less equipment for handling fuels, lubricants and greases is used, and less lubrication training is required.

A contractor who gets the kind of service Western is receiving on the Oahe Dam job knows he is making savings on the job. You can get such service. Call the Standard Oil office near your job wherever it is in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**



*You expect more from STANDARD  
and you get it!*

Eight years on the job for each of these men—Bob Friman, Red Napple of Standard and Western's general superintendent, A. "Blackie" Blackwell. More than 90 million cubic yards of earth and shale have been moved under Blackwell's supervision. Red Napple, Standard's staff engineer, has been working with contractors such as Western for 13 years. He has an engineering degree from the University of Missouri and, has completed Standard's Sales Engineering School.







Only the **"GENUINE"**  
can deliver what you have a right to expect

Only genuine Eaton Service Parts match the original production axle components in design, metallurgy, heat treatment, and quality of finish. Only by using genuine Eaton parts can you be sure that the newly installed units will deliver the same dependable, low-cost performance.

After many thousands of miles of service, even Eaton Axle components may require replacement. When this happens, be sure to specify that repairs be made with genuine Eaton Service Parts—it will pay out in extended axle life and freedom from schedule interruptions.



More than  
Two Million Eaton Axles  
in Trucks Today

# EATON

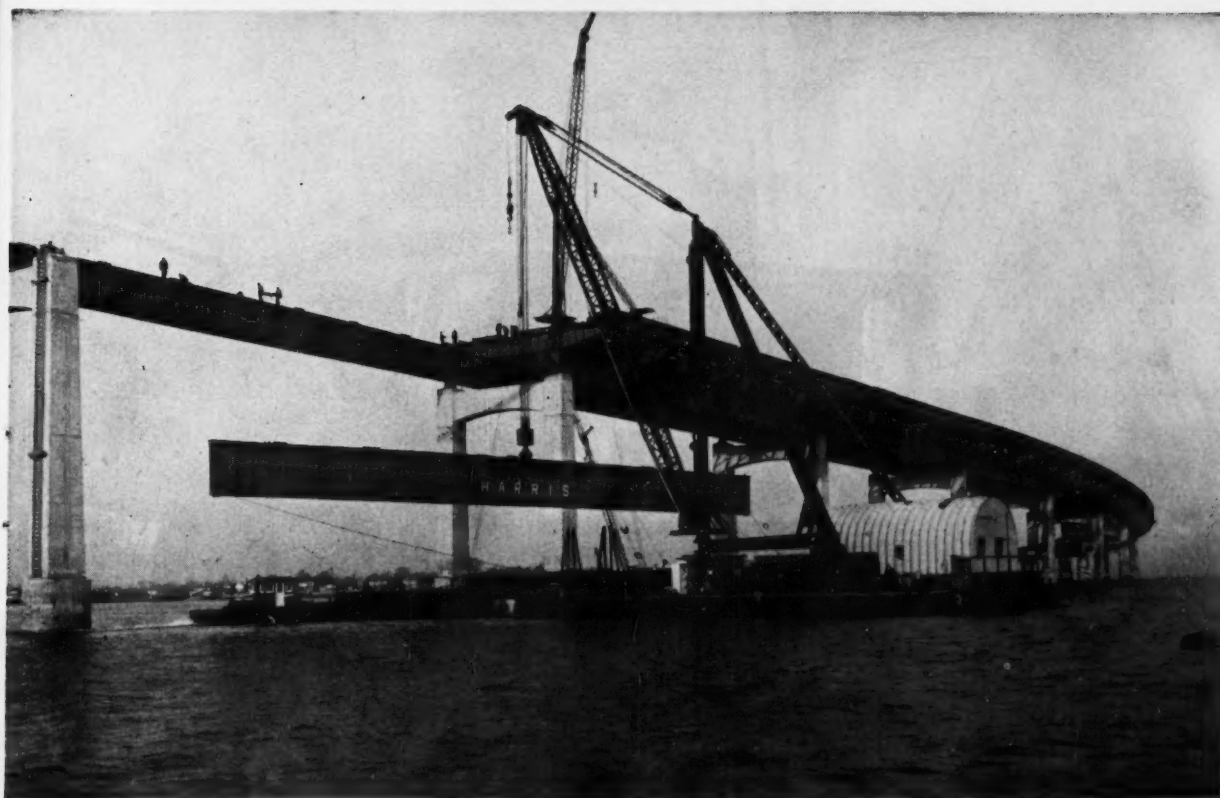
AXLE DIVISION  
MANUFACTURING COMPANY  
CLEVELAND 10, OHIO



**PRODUCTS:** Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps  
Truck and Trailer Axles • Truck Transmissions • Permanent Mold Iron Castings • Automotive Heaters and Air Conditioners  
Fastening Devices • Cold Drawn Steel • Stampings • Forgings • Leaf and Coil Springs • Dynamatic Drives and Brakes  
Powdered Metal Parts • Gears • Variable Speed Drives • Speed Reducers • Differentials • Centralized Lubrication Systems



**PICTURE  
OF THE  
MONTH**



## **Erecting Bridge Girders**

● Derrick boat lifts 125-ton girder 191 ft long into position on an approach span for the Throgs Neck Bridge across the East River in New York City. Harris Structural Steel Co. of New York has a contract to erect the superstructure for 4,610 ft of approaches on the Bronx side of the bridge. Harris barges the big girders to the site from a plant in New Jersey and erects them with a 150-ton-capacity derrick boat designed by their own engineers. American Bridge Division of U. S. Steel Corp. is spinning the cables for the 1,800-ft suspension span. The bridge will cost \$90 million.





# CHARLIE OWEN STAKES HIS WHOLE OPERATION ON CHEVY'S STAMINA AND TORSION-SPRING RIDE

C. L. Owen, vice-president of GO Oil Well Service, Fort Worth, puts his faith and \$15,000 worth of electronic equipment in his Chevy panel and sends it out on rugged oil field duty every day of the week. They used to have to pad the sensitive electronic recording panel to cushion out road shock and vibration. But not any more. Not with torsion springs soaking up bumps and jolts. Chevy's new ride is "made to order," according to Charlie Owen. "In our oil well locating operation we stay on the go anywhere, any time . . . and count on less breakage along with lower maintenance costs." The GO company goes for Chevy 100%. Driver John MacPherson says, "The '60 Chevy's ride and handling are really slick. You'd think this truck had power steering."

■ They're speaking right up, these owners of '60 Chevrolets, talking about a new truck build that's the best yet at putting out extra dollars'-worth of profit-producing work every day. And you'll be talking, too, once you turn these Chevy advancements loose on your money runs!

New truck-and-tire-saving ride that leads to shorter trip times, too. The biggest advance in trucking in years: independently suspended front wheels that step right over bumps, virtually eliminate most of the severe impacts that can wear out trucks and tires before their time. You profit by a big savings on maintenance; get a bigger daily work output because these trucks float you over rough roads with fewer slow-downs. And the tough torsion bar springs assist further in soaking up shocks before they can do any damage.

New longer lasting cab construction . . . new comfort that boosts driver efficiency. You'll find

that drivers stay fresher, work better in a new Chevy cab. There's more leg room, head room and hip room than ever before, new visibility that's greater by more than 26%, new foam-padded seat, new see-at-a-glance instrument panel. And new cab construction features—double-panel roof, box-section door pillars and many more—will help keep your Chevy on the road years longer.

Tough truck power that knows the most about saving money. Efficient Chevy short-stroke V8's that range from 160 h.p. all the way up to 230 h.p., offer as much as 335 ft.-lbs. of torque for toughest going. Or America's most widely used truck 6's, engines that do more work per dollar with time-proved, truck-built components. Look into it for yourself; Chevy's totally new working ability is available at your Chevrolet dealer's right now. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

## 1960 CHEVROLET STURDI-BILT TRUCKS



CHEVROLET

ANNOUNCING!

**A  
GREAT  
NEW  
TRUCK  
MIXER**



... with an old name in concrete

**DUNHAM PORTO-MIX CONCRETE MIXERS**

Engine take-off and motor driven models with capacities 4½ yards to 10 yards

Write for specifications and prices on sizes and models.



**MANUFACTURING COMPANY** Division of Anderson-Dunham, Inc.  
Manufacturers of Hydraulic Dump Trailers • Hydraulic Dump Bodies

Sales office and factory: Post Office Box 431 • Minden, Louisiana • Telephone: FRanklin 7-3535

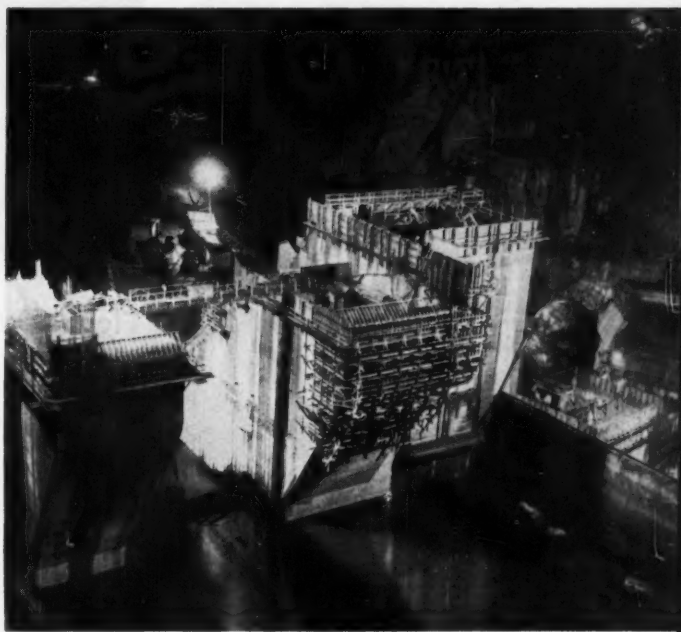
NOTE TO DISTRIBUTORS: We are looking for good distributors in areas other than the Southeast and Southwest.

We finance retail sales for distributors

## Construction News in Pictures...

### Day and Night

About 300 men are working around the clock to place 5,000 cu yd of concrete a day for Gorge High Dam on the Skagit River in Washington. The gravity section of the dam (foreground) now stands 250 ft above bedrock. The arch section (right) is 180 ft high. Merritt-Chapman & Scott Corp. is building the dam for Seattle City Light Co.



### Paving a Lake

Caterpillar grader, held on the slope by a cable to an International Harvester tractor, spreads soil-cement around the edge of Callaway Gardens Lake near Pine Mountain, Ga. Hugh McMath Construction Co. of Columbus, Ga., will spread 10 acres of soil-cement to keep the water of the lake clear and prevent bottom plant growth.



### Lava Defeats Dozers

Operator of this Cat D8 is fighting a losing battle to save the Hawaiian Village of Kapoho from destruction by a massive flow of molten lava. A fleet of 23 machines dozed up nearly 2½ miles of dikes in 10 days, but the lava finally broke through the dikes and entered the town. Lava flow was estimated at 5,100,000 cu yd a day.



### Delivering Aggregate

Long conveyor carries sand and gravel from an aggregate plant (not shown in the photo) to the concrete mixing plant (upper right) at Wanapum Dam. Grant County Constructors, a joint venture sponsored by Morrison-Knudsen Co., Inc., is building the dam on the Columbia River in Washington for the Grant County PUD.



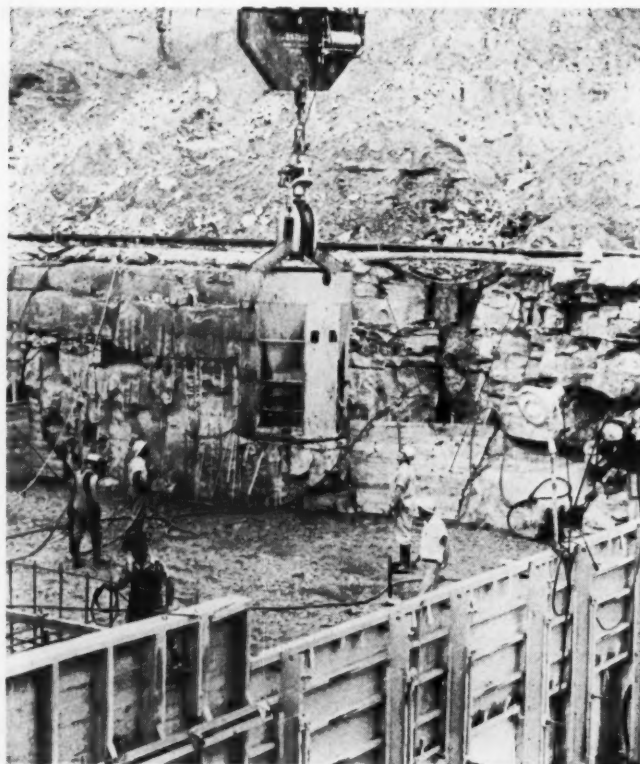
### Florida Water Line

Welders join two strings of 10-in.-dia pipe for a water distribution system near West Palm Beach, Fla. Workboat in the distance will pull the line under Lake Worth. Powell Brothers of West Palm Beach is installing the line with wrought iron pipe supplied by A. M. Byers Co. of Pittsburgh. The pipe needs no protective wrapping.

### Another Lift

Air-operated Blaw-Knox bucket begins to place a second 5-ft lift of concrete at Barkley Lock on the Cumberland River near Paducah, Ky. The lock will be 800 ft long and 110 ft wide. It will provide a single lift of 52 to 57 ft for marine traffic around the dam. Tecon Corp. of Dallas, Tex., is contractor for the Corps of Engineers.

*continued on page 66*



# IF YOU FASTEN TO, DRILL, OR CUT CONCRETE and STEEL...



## CAN DO THE JOB FASTER, EASIER AT MINIMUM COST

Whether you fasten to concrete or steel, drill or saw concrete or masonry, there's an OMARK tool made to help you do the job quicker, easier and at less cost.

Service, parts, supplies and repairs available nationwide through factory-trained personnel. Check your needs below and contact your OMARK dealer for details, demonstrations.

### DRIVE-IT POWDER ACTUATED TOOLS

OMARK DRIVE-IT tools use cartridges to drive hardened steel drivepins directly into concrete or steel . . . no drilling, power lines, or plugs. Fastenings withstand thousands of pounds pullout force. Simple and safe to operate. Used by electricians, general contractors, heating, ventilating men, acoustic contractors and other building tradesmen.

### OMARK-GRAHAM STUD WELDING SYSTEM

For permanent installation of insulation to metal buildings, sheet metal ductwork, tanks, boilers use the OMARK-GRAHAM stud welding system. Easy, simple to use. Needs only 115 volt power line. Welds pointed pins to many types of metal, without burn-through or distortion, for attaching insulating material. No flux, ferrules or special material preparation needed.

### OMARK DIAMOND DRILLING, SAWING TOOLS

You can bore through concrete, brick, tile and masonry easily with an OMARK diamond drilling machine. Operates at any angle, drills holes from 1/4" to 18" in diameter. For sawing concrete slabs, choose one of four models of gasoline engine OMARK concrete cutters. Cut up to 12 ft. per minute. For sawing tiles, bricks, concrete blocks use an OMARK Diamond masonry saw. Zip through the largest block in one pass.

*Remember, for concrete and steel fastening, drilling, sawing equipment, consult your OMARK dealer for high quality tools, dependable service.*

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**OMARK Industries, Inc.**

9701 S. E. McLoughlin Blvd., Portland 22, Oregon

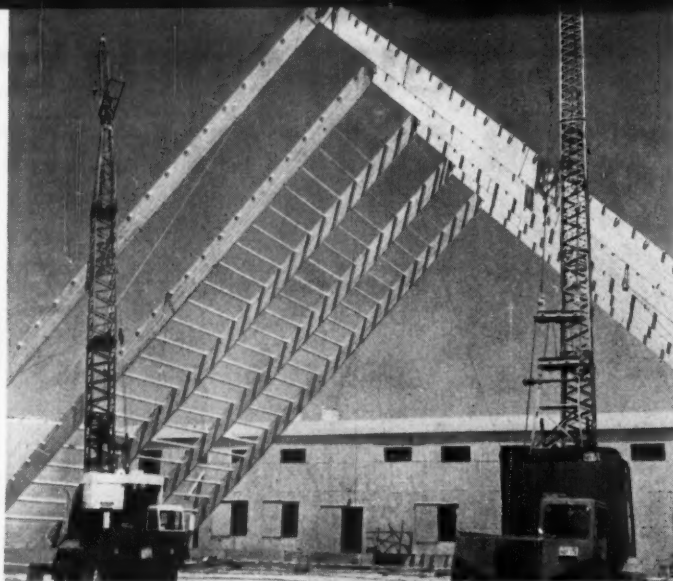
Branch Offices: Westwood, Mass.; Baltimore, New York, Miami, Tampa, Orlando, New Orleans, Mobile, Cincinnati, Milwaukee, Dallas, St. Louis, Chicago, Los Angeles, San Francisco.

Drilling, Sawing Concrete, Masonry  
with OMARK Diamond Saws, Drills.

**CONSTRUCTION NEWS**  
**IN PICTURES . . . continued**

**Wood Frame**

Cranes hold a pair of 100-ft-long laminated wood beams in position while a workman bolts the steel plates joining the beams at the 73-ft-high peak of the steeply gabled roof. Fir plywood on top of 4x8 wood purlins will complete the timber framework of the roof. The building is a 140x180-ft sugar beet warehouse near Tracy, Calif.



**Digging for a Bridge**

Clamshell excavates material from the bottom of Honolulu harbor where the Corps of Engineers is supervising construction of a new Bascule bridge across the Second Entrance Channel. Before the clamshell started work, dredges took out about 2,000,000 cu yd of material to clear the channel. The bridge will span 250 ft over the channel.

**Deep Foundation**

Lima crane with a dragbucket works in the bottom of the Colorado River in Arizona where Merritt-Chapman & Scott Corp., is building the \$108-million Glen Canyon Dam for the Bureau of Reclamation. Benches in the canyon wall are for the west abutment of the powerplant. Lower portal of the powerplant access tunnel can be seen at the upper right.





# **BANTAM ignores wet weather ...helps cut job time 25%**



## **OWNERS SAY:**

**"BANTAM is the fastest rig available today!"**

Water and Sewer Contracting Co., Memphis, Tennessee, is a new business venture—up against tough competition in residential sub-contract work.

But partners A. N. Day and P. Broskey have excellent business know-how—and *two* BANTAMS! On one of their first big jobs, 60 days were estimated for putting in 15,000 feet of sewer main and 10,000 feet of house connections. Even with lots of rain, BANTAM helped wrap up the job in just 45 days.

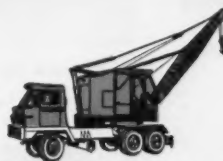
BANTAM delivered an easy daily production of 700 feet of 6- to 8-foot trench—and enabled the partners to do the *whole* job of digging and connection in *one* operation. "Speed is important to us," they report, "and BANTAM is the fastest rig available today!"

You can bank bigger profits on BANTAM's speed, too. A BANTAM C-350 is the easiest handling, liveliest cycling, biggest producing crawler machine its size. And BANTAM makes more money for you by its practical, permit-free size for fast job-to-job moves. Your higher earnings continue for more years with BANTAM's advanced engineering, modern assembly-line production methods and heftier, stronger components. BANTAM is the most job-versatile rig you can own—it earns with 11 BANTAM-built attachments, including new, optional long-boom back hoe for digging depth of 18 feet, 10 inches.

## **SEE YOUR BANTAM DISTRIBUTOR TODAY!**

Size up BANTAM's full capability yourself on a job test. Call your BANTAM Distributor for a demonstration; get the full BANTAM profit story!

## **BANTAM HAS THE CRANE-EXCAVATOR YOU WANT ...**



New T-350 BANTAM with BANTAM-built carriers—four to choose from—for exact budget and job needs. Capacity to 11 tons.



The new, all-purpose contractors' tool—BANTAM CR-350. One-man, one-engine operation. Capacity to 11 tons.



221 Park Street, Waverly, Iowa  
**WORLD'S LARGEST PRODUCER OF TRUCK CRANE-EXCAVATORS**

**See how you can earn more  
with a versatile BANTAM  
MAIL THIS COUPON NOW**

Schield Bantam Co., 221 Park St., Waverly, Iowa

CM-276A

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Send catalogs on: ☐ T-350 BANTAM, ☐ C-350, ☐ CR-350.

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## Jaeger announces new high-performance pumps that are quicker and easier to maintain



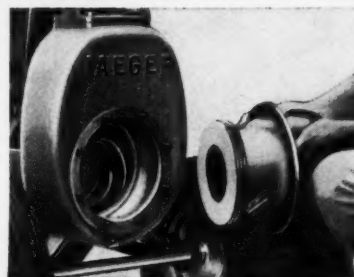
**NEW MODEL 3PN**, above, pumps all the water a 3" suction hose can handle at 5' lift. Pumps 28,000 gph at 10' lift when a 4" suction hose is used. Sure-priming is correspondingly fast, at all practical suction lifts.

**MODEL 3XPN** is a comparably improved smaller 3" pump. We believe it is the finest pump you can buy under the AGC "15-M" rating.

**LOOK HOW EASY TO MAINTAIN:** New

design of both pumps enables you to remove suction chamber and liner without removing volute, and quickly rotate or replace the liner plate or adjust its clearance with plastic shim gaskets. Maintains peak efficiency.

Jaeger pumps know how to handle water. For the right pump for any dewatering or pressure pumping problem, see your Jaeger distributor or send for latest catalog.



**BIG CAPACITY FOR BIG JOBS:** This Jaeger 10" is doing a fast job of dewatering a 43½' x 129½' x 26' deep cofferdam after the pouring of an 8' thick bridge pier foundation with 1500 cu. yds. of tremie concrete. With a Jaeger 6" pump also on the job, contractor had well over 300,000 gph of water handling capacity.



**DIAPHRAGM PUMPS HAVE SHOCK-ABSORBING SPRING-BOTTOM BOWL:** Cushions impact of stones and foreign matter on dirty pumping jobs. Also prevents build-up of cement where grout is present. In 3" and 4" models.



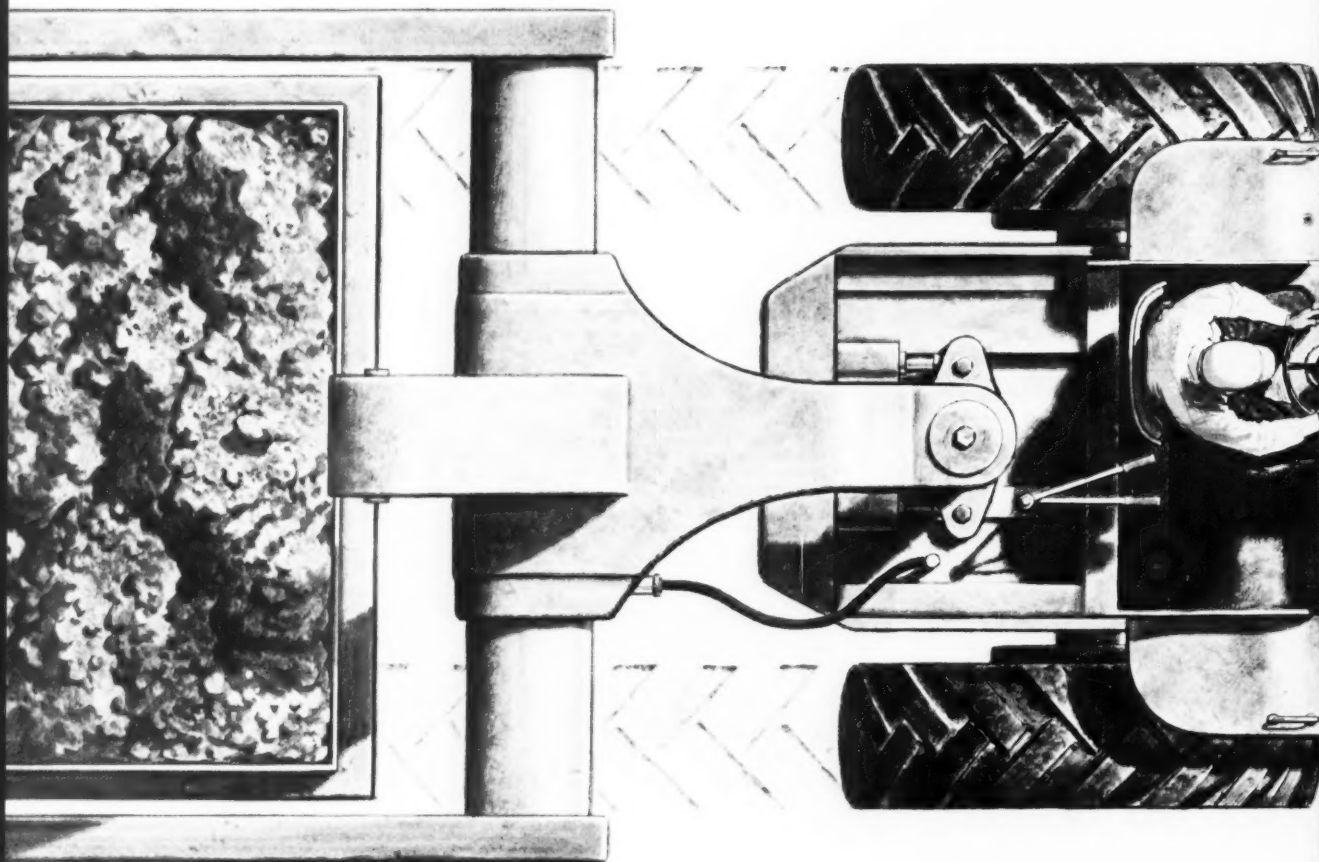
**JAEGER 4P IS RIGHT PUMP FOR THIS 18' DEEP SEWER TRENCH:** Provides big water handling capacity with portability on work where the pump moves with the job.

**THE JAEGER MACHINE COMPANY, 800 Dublin Avenue, Columbus 16, Ohio**  
Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario



Think  
twice  
about  
your  
power





Carry this handy pocket guide with you—let it help you when you are selecting your new equipment. ➡



# Up production, lower costs... specify Cummins Diesels

Cummins Diesels are built to beat construction deadlines. Day-in, day-out they stay on the job, delivering more work per hour—more profit per load. With performance like this available—think twice before accepting ordinary power.

It's the way Cummins builds their construction diesels. Special design features are incorporated to safeguard performance. Cummins dirt-proofing seals the engine against the entry of dust and abrasives—internal design permits high angular operation.

Further, Cummins gives you the advantages of 4-cycle operation for long engine life, and the Cummins PT fuel system for better fuel economy. In fact, you can save 25%—30% in fuel costs alone over engines of two-cycle design.

But the pay-off comes when you total your operating costs. You'll find your Cummins-powered machines have done more work with less downtime.

There's a Cummins Diesel for every construction application. Thirty-eight engines—from 70 to 600 h.p.—are available in over 300 leading construction equipment models. (See guide below.) It's easy to standardize on Cummins!

Remember . . . think twice about your power, *specify Cummins.*

## PAVERS

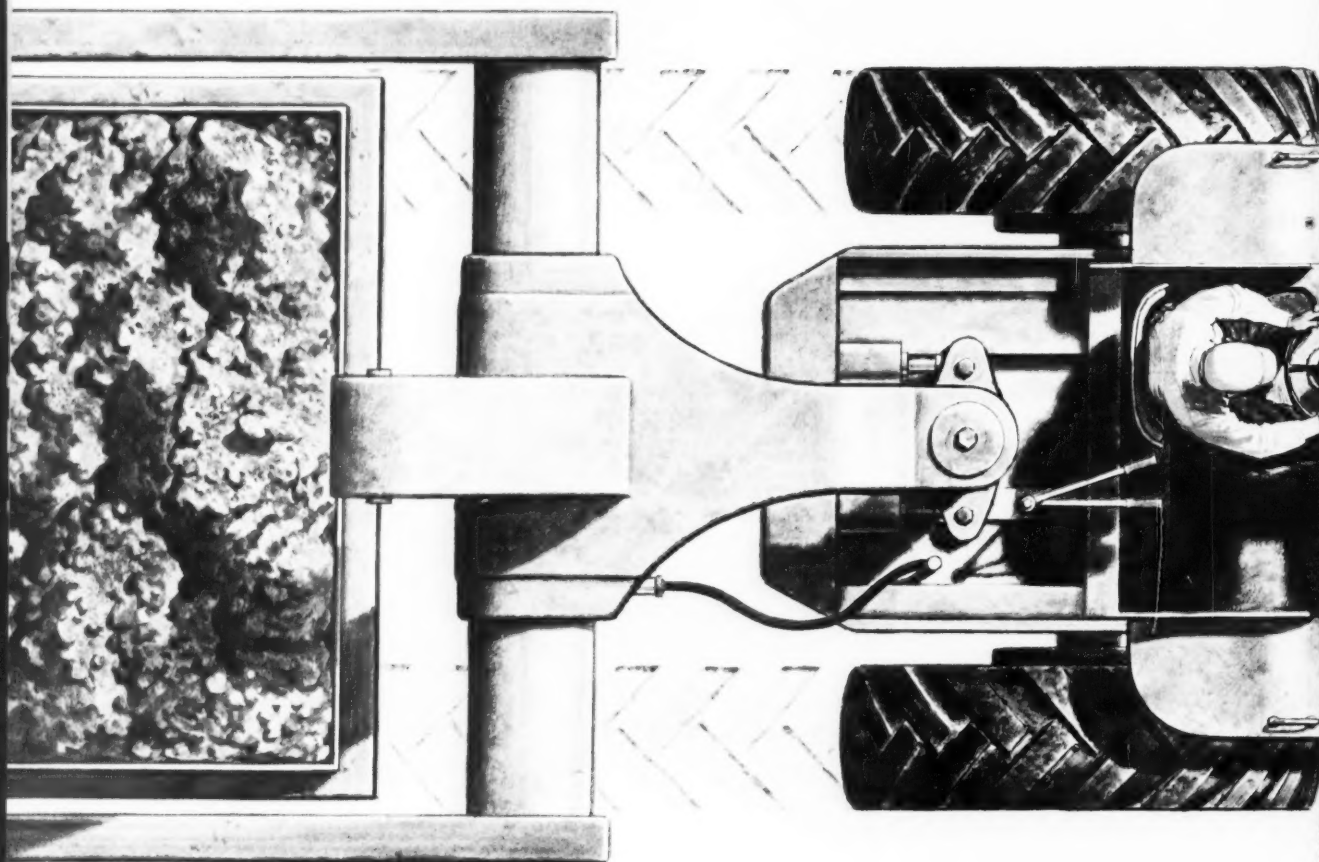
MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Chain Belt Company -Rex Div.	Paver	160 h.p.
Koehring	Paver	160 h.p.
Worthington	Paver	160 h.p.

## AIR COMPRESSORS

Chicago-Pneumatic	900 cfm	335 h.p.
Joy	900 cfm	335 h.p.
Worthington	315 to 600 cfm	130 to 220 h.p.

## GRADERS

MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Adams	4 and 6 wheel	100 to 190 h.p.
Austin-Western	4 wheel	110 to 160 h.p.
Galion	4 and 6 wheel	100 to 220 h.p.
Huber-Warco	4 and 6 wheel	130 to 160 h.p.
Pettibone-Muliken	6 wheel	160 h.p.



# **TRACTORS, TRACTOR-DOZERS AND TRACTOR-SHOVELS**

MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Clark	Tractor-Shovels 2¼ to 6 yd. Tractor-Dozers, 28,800 to 67,000 lbs.	175 to 335 h.p. 175 to 335 h.p.
Eimco	Tractors, Bulldozers and Loaders	130 h.p.
Hough	Tractor-Shovels	110 to 300 h.p.
LeTourneau- Westinghouse	Tractor-dozers	210 h.p.

MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Mixermobile	Scoopmobiles, 1 to 6 yd.	80 to 270 h.p.
M-R-S	Tractors	220 to 600 h.p.
Pettibone-Muliken	Tractor-shovels, 1½ to 3¼ yds.	105 to 175 h.p.
Thew	Moto-loaders	110 h.p.



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## TRACTORS, TRACTOR-DOZERS AND TRACTOR-SHOVELS continued

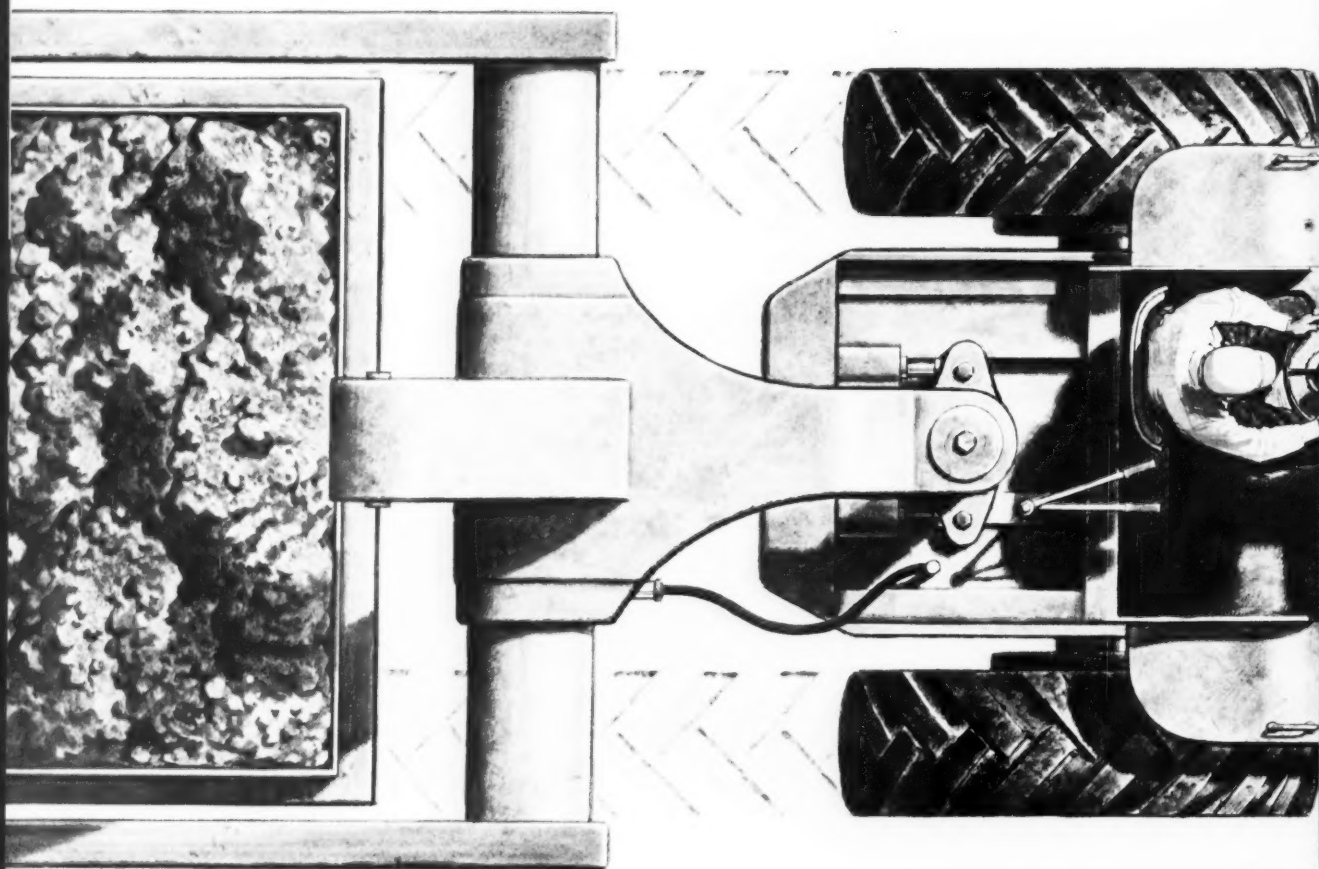
MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Wagner	Tractors Tractor-dozer	110 to 320 h.p. 160 to 220 h.p.
Westfall	Tractor-dozer, 16,550 to 40,000 lbs.	130 to 335 h.p.
Yale & Towne- Trojan Div.	Tractor-Shovels, 2 to 4 yd.	110 to 220 h.p.
<b>DITCHERS</b>		
Barber-Greene	Ditchers	100 to 320 h.p.

## BATCH PLANTS

MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Barber-Greene	Batch Plants	100 to 320 h.p.
Hetherington & Bernier	Portable Bituminous Mix Plant	100 to 450 h.p.

## BUCKET LOADERS

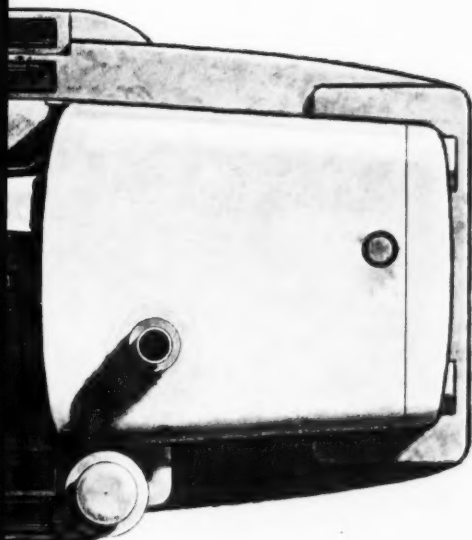
MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Barber-Greene	Bucket Loader	100 to 320 h.p.
Pettibone-Mulliken	Bucket Loader	115 h.p.



## CRANE CARRIERS

MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL	MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Baldwin-Lima-Hamilton	20 to 70 ton	175 to 220 h.p.	K-W Dart	25 to 40 ton	175 to 220 h.p.
Crane Carrier Corporation	Crane Carrier	175 h.p.	Thew	Crane Carriers	160 to 300 h.p.
Hendrickson	6 and 8 wheel	220 h.p.	Warner & Swasey, Duplex Div.	4 x 2 to 8 x 4	110 to 195 h.p.

# Up production, lower costs... specify Cummins Diesels



Cummins Diesels are built to beat construction deadlines. Day-in, day-out they stay on the job, delivering more work per hour—more profit per load. With performance like this available—think twice before accepting ordinary power.

It's the way Cummins builds their construction diesels. Special design features are incorporated to safeguard performance. Cummins dirt-proofing seals the engine against the entry of dust and abrasives—internal design permits high angular operation.

Further, Cummins gives you the advantages of 4-cycle operation for long engine life, and the Cummins PT fuel system for better fuel economy. In fact, you can save 25%—30% in fuel costs alone over engines of two-cycle design.

But the pay-off comes when you total your operating costs. You'll find your Cummins-powered machines have done more work with less downtime.

There's a Cummins Diesel for every construction application. Thirty-eight engines—from 70 to 600 h.p.—are available in over 300 leading construction equipment models. (See guide below.) It's easy to standardize on Cummins!

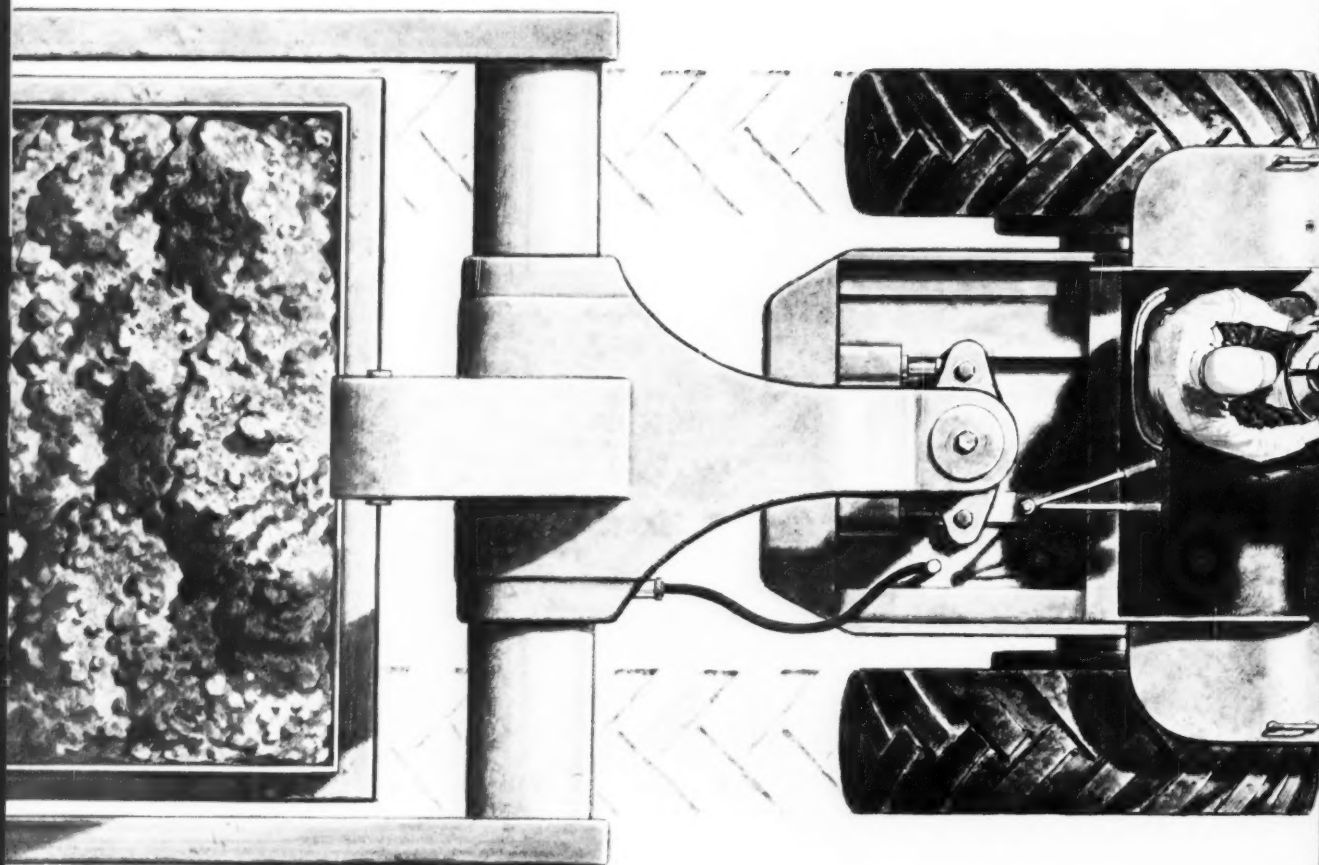
Remember . . . think twice about your power, *specify Cummins.*

## DRILLS

MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Bucyrus-Erie	Rotary Blast Hole Drills	160 to 320 h.p.
Chicago Pneumatic-Reichdrill Div.	Crawler-mounted Blast Hole Drills	160 to 262 h.p.
Davey Compressor	Truck-mounted Drill	160 h.p.
Star Drill Keystone	Truck-mounted Drill	175 h.p.

## ROAD ROLLERS

MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Bros, Inc.	Rubber-tired Roller	130 h.p.
Buffalo-Springfield	Rubber-tired Roller	130 h.p.
Galion Iron Works	Rubber-tired Roller	130 h.p.



## CRUSHING PLANTS

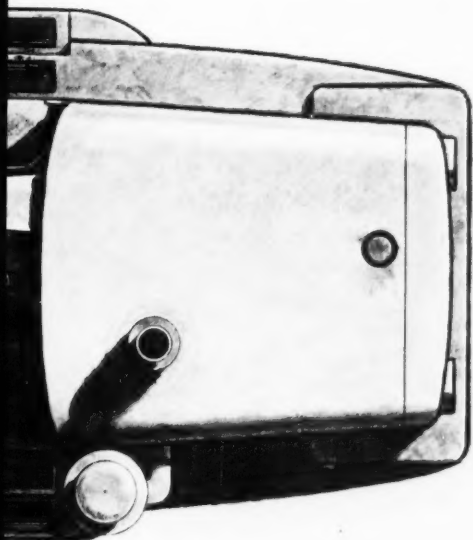
MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Bros, Inc.	Preparator	240 h.p.
Diamond Iron Works	Crushing Plants	100 to 300 h.p.
Iowa	Rock Crushers	160 to 320 h.p.
Lima-Austin-Western	Portable Crush Plants	100 to 240 h.p.
Pioneer	Crushing Plants	335 h.p.

## COMPACTORS

MANUFACTURER	CAPACITY OR TYPE	CUMMINS DIESEL
Bros, Inc.	Compactors	115 to 240 h.p.
Buffalo-Springfield	Compactor	130 h.p.
Wagner	Compactor	220 to 320 h.p.



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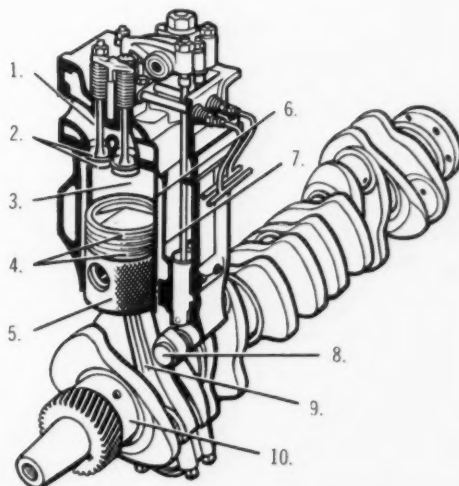
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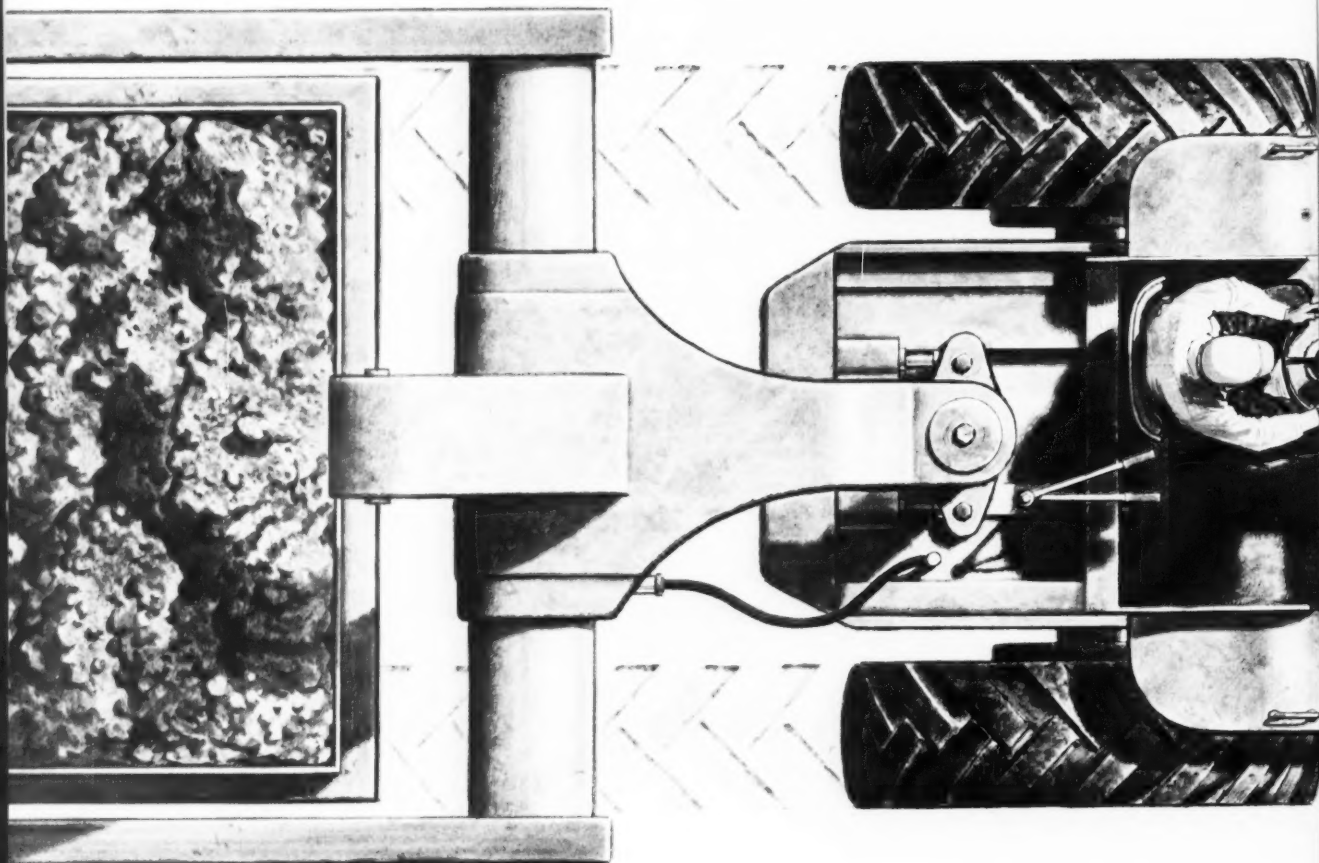
Remember . . . think twice about your power, *specify Cummins.*

## CUMMINS INTERNAL ENGINE DESIGN

1. LARGE EXHAUST AND AIR PASSAGES offer minimum restriction to exhaust and air flow.
2. OVERHEAD VALVES are precision machined from high strength alloy steel. Stellite valve seat inserts resist corrosion.
3. OPEN-TYPE COMBUSTION CHAMBER gives most efficient combustion—most power per cubic inch—more power from each gallon of fuel.
4. KEYSTONE COMPRESSION RINGS seal the combustion chamber. Top ring is chrome plated for long life.
5. CAM-GROUND PISTONS assure perfect fit in cylinder at operating temperatures.

6. REPLACEABLE WET-TYPE CYLINDER LINERS dissipate combustion chamber heat to coolant rapidly.
7. LARGE VOLUME WATER PASSAGES give even flow of coolant around cylinder liners, valves and injectors.
8. CAMSHAFT is geared to crankshaft for positive control of all valve and injector movements.
9. CONNECTING RODS are forged from high tensile strength alloy steel. I-beam section gives maximum strength.
10. CRANKSHAFT is precision machined and ground from high tensile strength steel forgings.





## **CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA**

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# Up production, lower costs... specify Cummins Diesels

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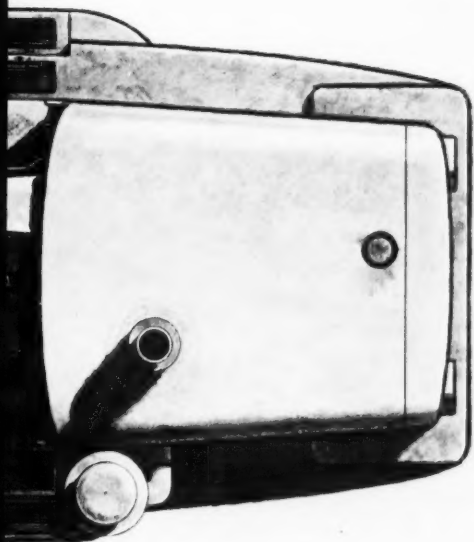
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Remember . . . think twice about your power, *specify Cummins.*

Cummins service is one of the big reasons why more contractors specify Cummins Diesels.





## Think twice about your service!

More than 500 service points throughout the United States and Canada are geared to give you fast, efficient help.

In addition to these permanent locations, temporary shops and mobile parts and service trucks bring Cummins Service right to the construction site. Service availability is one of the important reasons why leading contractors specify Cummins Construction Diesels for both their American and overseas projects!

**Cummins Engine Company, Inc.**

Columbus, Indiana

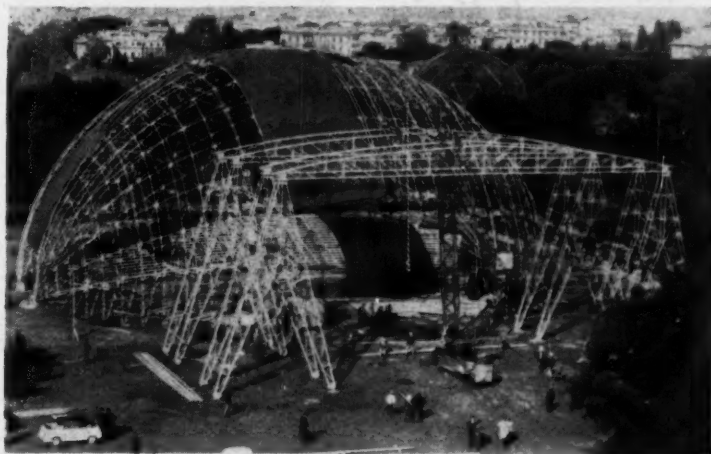
Litho in U.S.A.



# Construction 'Round the World . . .

## In Italy

Small truck crane erects steel framework for new portable tent theater in Rome's Villa Borghese Park. Canvas will be stretched across the framework, 65 ft high and 150 ft across, to protect audiences. A caravan of 45 trailer trucks will transport the tent theater, stage settings, costumes, and a troupe of actors up and down Italy.

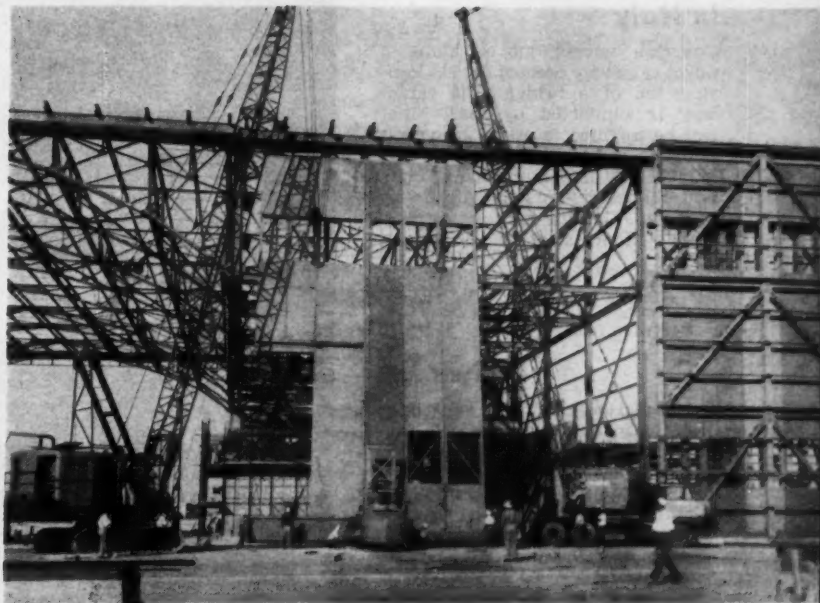


## In Canada

Northwest crane places timber piles in holes drilled 24 ft into permafrost on Baffin's Island. A mixture of sand and gravel, packed into the holes and soaked down, becomes a permanently frozen casing for each pile. Merritt-Chapman & Scott is building the Air Force refueling base, including structures, 175 mi south of the Arctic Circle.

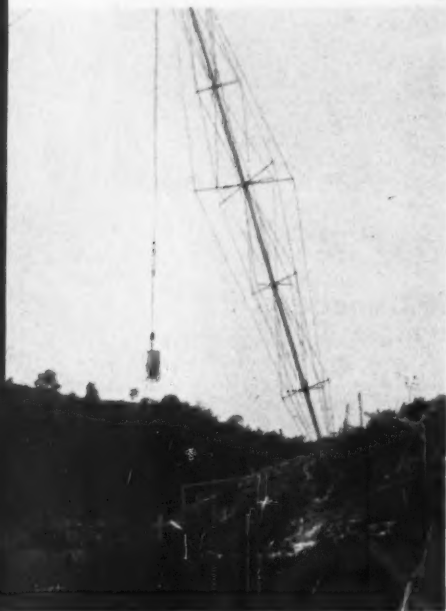
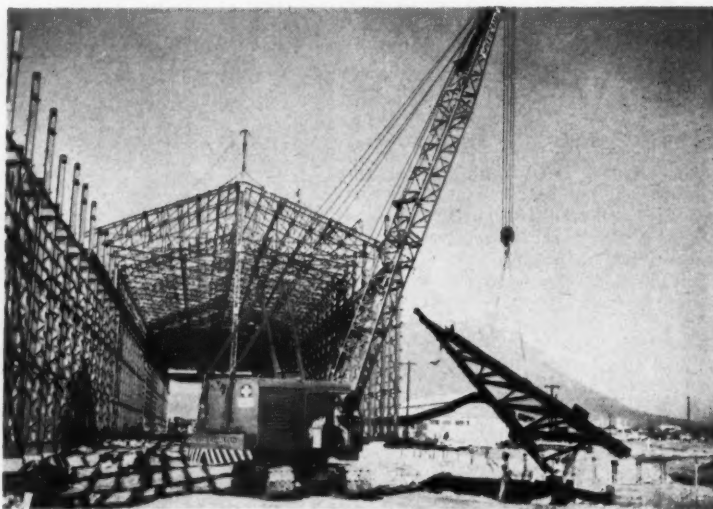
## In Libya

A Bucyrus-Erie crawler crane and a Lorain truck crane team up with a Ross fork-lift truck to position a hangar door at Wheelus Air Base, Tripoli. The door is 60 ft high, weighs 20 tons. A joint venture of Crow-Steers-Shepherd is contractor for the \$70-million job, which has been under way for 9 yr. The Corps of Engineers directs the project.



### ***In Mexico***

A Manitowoc 3000 crawler crane erects structural steel for a steel plant near Monterrey. The plant will include four structures being built for Aceros Planos de Monterrey, S.A., as part of a \$58.3-million expansion program, scheduled for completion this year. Each building will be 31 ft wide, 1,040 ft long.

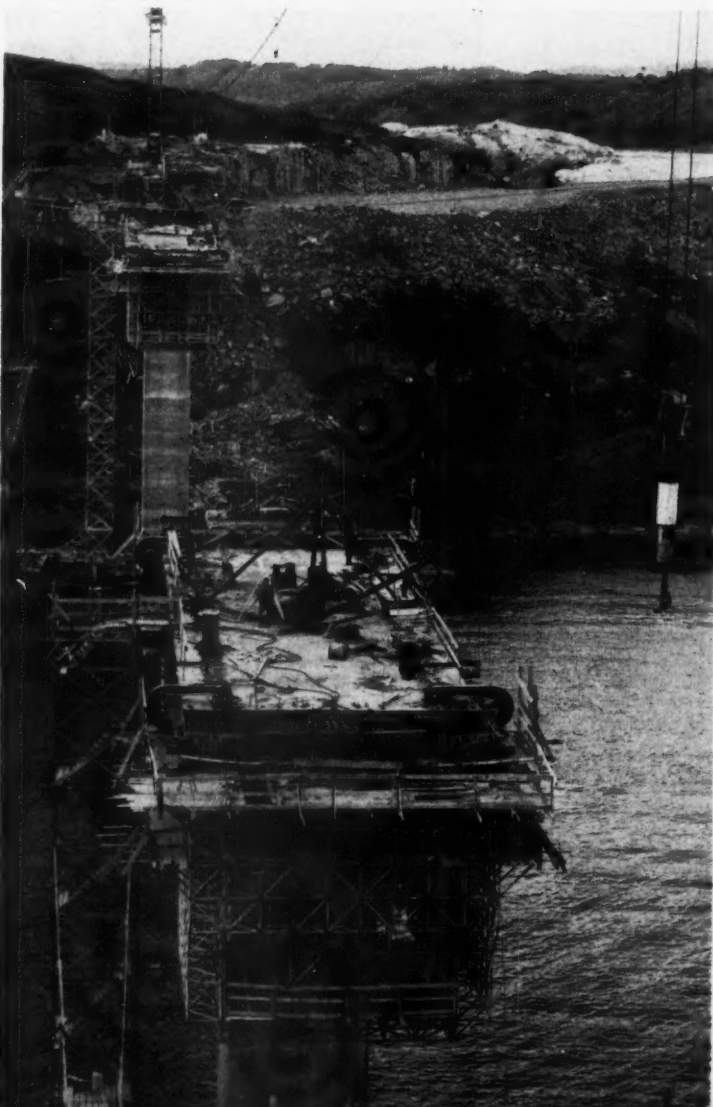


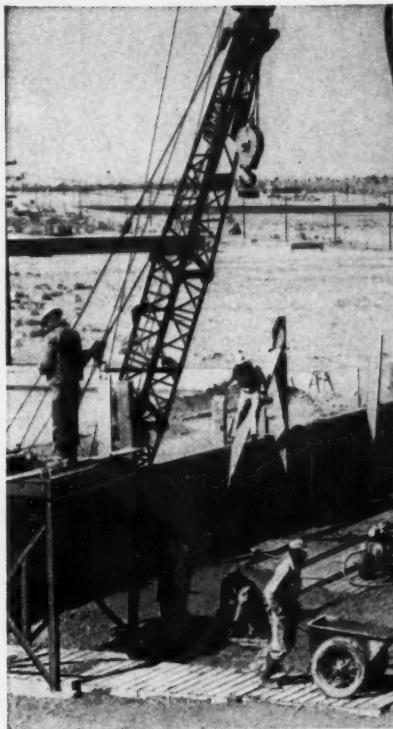
### ***In Italy***

Concrete bucket moves along a novel cableway erected for the construction of a bridge. The cableway is supported by masts that can be inclined laterally to permit pouring across the width of the bridge. The masts are 105 ft high, and the cableway has a capacity of 2 tons. Centine E Blondins Cruciani of Rome is cableway designer.

### ***In Sweden***

Cantilevered scaffolds suspended from rails support forms for a prestressed concrete girder bridge, 30 ft wide and 1,060 ft long, linking mainland with the Island of Tjorn. Simultaneous pouring of girders and deck proceeds at a fixed schedule from each side of the land-based piers. The bridge is one of three totaling 3,500 ft in length.





**Every Hour Saved  
means \$100. to \$1000. Earned  
in Concrete Placing Jobs!**



*and here are a few timesaver ideas!*

**Team up equipment to prevent delays** which keep men idle—equipment costs are much less than lost man hours.

**Use two or even three concrete buckets** on a pouring job. While the crane spots one bucket and the concrete is being dumped, the other bucket can be filled, thus you can almost double output by eliminating waiting time between bucket loadings.

**Accordion Hopper attachments** on Gar-Bro Concrete Buckets guide concrete into narrow wall forms—prevent spillage and speed up the placing job.

**When placing concrete in piers,** use two or three collection hoppers with flexible steel drop chutes to direct concrete without segregation. Thus you can rotate the chute lines and shorten one line while the

other is in use. This will eliminate delays of the bucket and crane and transit mix trucks.

**Use Receiving Hoppers,** either floor hoppers or portable hoppers for intermediary storage of concrete. Thus you keep a steady supply of concrete and prevent stoppage of the cart crew. At the same time you eliminate delays of transit mixers.

**Supply your men with carts** that are designed for handling concrete—Gar-Bro Concrete Carts—they are *balanced when fully loaded*; are easy to handle, easy to dump.

Concrete placing has become a science in the past ten years and, today, in the contracting business only careful planning and proper equipment can guarantee adequate profits.

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## Realistic Wage Rates

IN THE FEDERAL-AID HIGHWAY ACT of 1956, Congress saw fit to include a provision that the Davis-Bacon Act should apply to construction of the interstate portion of the highway network. At that time, we predicted trouble:

*"Under Davis-Bacon, wage rates are set by the Secretary of Labor to conform with those prevailing on similar work in the immediate vicinity. That sounds harmless enough. But the Secretary determines the 'prevailing' rate, and there have been instances in the past when such determination has been arbitrary, unrealistic, and costly. Nor is there any recourse through the courts to set aside incorrect rates.*

*"Extension of the Davis-Bacon Act to highways will increase the cost of construction and the cost of government. It will interfere with free collective bargaining and will hamper contractors' operations."*

Unfortunately, those predictions have come true. That this is so is made abundantly clear by results of a mail survey conducted among state highway departments by Frank W. Cantrell, executive vice president of Associated Industries of Arkansas, the state chamber of commerce. The survey asked whether Labor Department's fixing of wage rates for interstate system projects had increased construction costs.

Replies were received from 40 states. Seven replied frankly that they didn't know whether the Davis-Bacon rates had raised costs, and 15 said the law had little effect. But 18 states reported that it was a definite factor in increasing the cost of the interstate system. Additionally, 11 of the states complained of the administrative red tape involved.

Replies indicated that the cost increase attributable to application of Davis-Bacon ranged from 3 to 25%. Many complained that metropolitan wage scales were extended to rural areas. Others cited instances of artificial job classification or "upgrading." One highway department listed wage rates for roadbuilding jobs and showed carpenters and laborers getting 25% and 80% more, respectively, than their counterparts on "general" construction.

The Associated General Contractors of Iowa cites a somewhat similar instance. On a small steel bridge job, structural iron workers were paid \$3.30 an hour, which was the building-construction rate, rather than the \$2.40 highway rate. This then became the "prevailing" wage, even though the contractor's records showed no more than four iron workers employed at one time.

Well, all this causes needless extra costs that the tax-paying public must assume.

The Administration says it is worried about inflation. It also has a problem in securing adequate financing for the highway system. It can make a prompt start toward solving both these problems by putting its wage determinations on a realistic basis that is fair to labor, to the contractor, and to the public, alike.

# Seven Sections Of Old Stadium Roll 225 Ft To New Site



**DISSECTED STADIUM**—Two sections of Texas Tech stadium already have been moved back 225 ft to new location. Remaining five

ENLARGING a football stadium for Texas Tech in Lubbock turned out to be a spectacular and unusual sort of construction operation.

The contractors sliced the 27,000-seat stadium into seven sections, rolled the sections back 225 ft, and put them together again. Then they excavated 185,000 cu yd of earth from the center of the arena to lower the playing field 30 ft. Last step will be to install new seats, extending down to field level. They will end up with a bowl stadium that will hold 40,000 people.

General contractor on the \$1,773,000 project is Cain & Cain of Fort Worth. LaPlant-Adair Co. of Indianapolis, Ind., had the subcontract for \$310,000 to move the stadium back. As far as they know, this the first time that anything like this has been done before.

## Moving Operation

The stadium originally was built in seven sections. So the move boiled down to a job of moving seven individual structures. The five inside sections were 60 ft wide and 112 ft deep

from front to back. Each weighed 350 tons. The two end sections were 84 ft long, 112 ft deep, and weighed 435 tons.

Concrete columns supported the stadium. Each of the five inside sections had 18 columns, 6 in each of 3 rows. The end sections had 24 columns each. The columns varied in size from 16x16 in. to 28x28 in.

The general moving technique was to fasten horizontal steel beams between the columns and insert rollers underneath them. Then the concrete columns were cut. A winch truck pulled the sec-

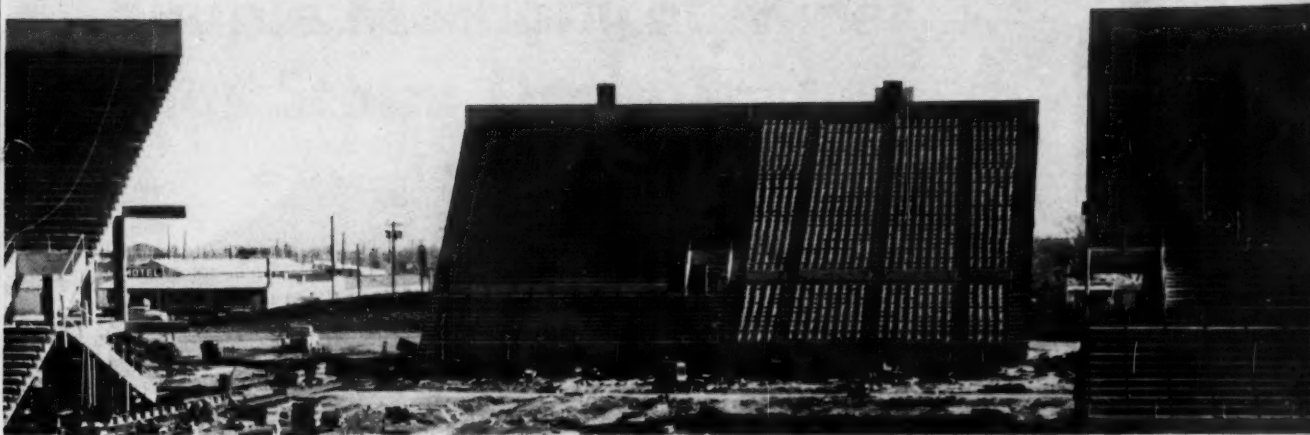
## Crews Move One Section at a Time



**TRACKS**—First step in moving operation is to lay three two-rail tracks behind each stadium section. Rails are on 6x6-in. ties. Wedges control rail elevation to 1/64 in.

**SETTING ROLLERS**—Workmen place rollers under WF beam and drive wedges to set the top of the WF at the proper elevation. Rollers are spaced 9-in. apart under sections.





sections will follow. Contractor is lowering field 30 ft so that new seats can go in front of old sections. Capacity will be 40,000.

tion back to the new location where footings had been prepared. The columns were centered over the new piers and connected to them. Then the rollers and equipment moved to the next section.

### Three Tracks

The Santa Fe Railway supplied 4,500 ft of 90-lb rail for the job. LaPlant-Adair set up three two-rail tracks behind the section they were about to move. Each track ran along one side of a column line. The rails in each track were spaced 20 in. apart.

The tracks were set on 6x6-in.

pine blocks 3 ft long. Under the blocks were longitudinal planks that acted as mud sills.

At every stage of the operation it was essential to keep the structure rigid and prevent settlement. The ground under the rails (variously hard clay, a paved road, and Texas caliche) gave solid support. After it was rough-graded, crews added sand as a sub base to level the track.

They set the rails to an accuracy of 1/64 in. To maintain this level, they set a bench mark on every column and checked it prior to, during, and after each move.

They made a final check when the section was in its new position.

Each track carried 150 rollers about 2 in. in dia. Rollers were 24 in. long and weighed 26 lb. They were spaced 9 in. apart under the sections.

On top of the rollers was a 12-in. 125-lb WF beam with web stiffeners welded to it. Between the WF and the rollers was a steel plate and a 2-in. wood filler. Wedges were driven between the WF and the wood under it to control the elevation of the top of the beam.

Each track ran beside a row of

**READY TO MOVE**—Weight of section now has been transferred to rollers through temporary support system. Columns have been cut.



**FINAL POSITION**—Winch truck has hauled the section back 225 ft. Columns have been set over new footings, will be connected to them.

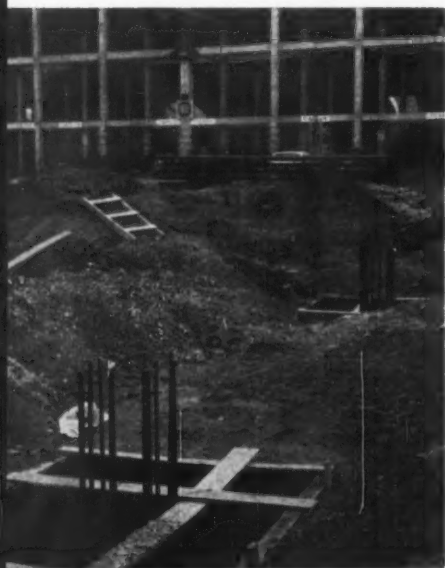






**EXCAVATION**—Bucyrus-Erie 1 1/2-yd shovel feeds fleet of 12 trucks. Total of 185,000 cu yd has to be removed from playing field to

lower it 30 ft. Daily production is about 2,400 cu yd. Pioneer Pavers Co. of Lubbock, Tex., has \$660,000 contract to do the job.



**FOUNDATIONS**—New footings for each stadium section are prepared prior to move. When section is over these footings, new column bottoms will be poured in place.

stadium columns. To transfer the weight of the column to the WF beams on the rollers, the contractor laid a second set of transverse WF beams across the rail-mounted WF's. These beams, in turn, carried the load from vertical posts held against two opposite sides of the column.

The posts were held tightly against the faces of the column by four clamps. The clamps consisted of a 32-in. long, 15.6-lb ship channel on each side of the column tied together by two 1 1/8-in. bolts.

When the weight of the section had been transferred to the rollers, crews drilled three holes in each side of the columns and cut them with a paving breaker.

A single Gar Wood winch truck with 5/8-in. line and a 30,000-lb pull hauled the section back to the new location.

At the new position, crews welded the reinforcing in the columns to the reinforcing in the new

piers. Then they poured the concrete for the new section of the columns. After it had set, they transferred the weight of the section from the rollers to the columns and removed the rollers.

It took about 7 days to move each inside section, 10 days for each end section. Moving operations started in mid-December.

#### **Excavation**

Pioneer Pavers of Lubbock has a \$660,000 contract for the earthmoving. They remove about 2,400 cu yd a day with one 1 1/2-yd Bucyrus-Erie 38-B shovel and a fleet of eight 11-yd International trucks and four 5-yd Fords. A Cat D7 bulldozer and a Michigan 125 front end loader handle miscellaneous earthmoving chores.

#### **Men on the Job**

For LaPlant-Adair, Kenneth Adair is owner-operator and Ed Pescheau is job foreman. Cecil Pray represents Pioneer Pavers.



# Simple Mechanical Miner Digs Storm Drain Fast

DRIVING a 10x11-ft semi-elliptical tunnel through hardpan and stiff gravely clay 40 ft in an 8-hr shift is no mean feat. It becomes even more impressive when the ground has to be supported by ribs and solid lagging kept right up to the face. Yet John Doherty Co. is making that progress on a storm drain in Chicago, thanks to an ingenious mining machine that weighs only 2,500 lb.

The mechanical miner cuts a 10 1/3-ft-dia circular bore, which is hand-trimmed to final cross-section. Six hydraulic rams support the rig in the tunnel, two others shove it forward. As the machine advances, an electrically driven cutting wheel on the head end grinds material from the tunnel face. The wheel

dumps the muck onto the miner's integral conveyor, which carries it to the rear to load mine cars. A locomotive hauls these to a shaft for hoisting and emptying above ground.

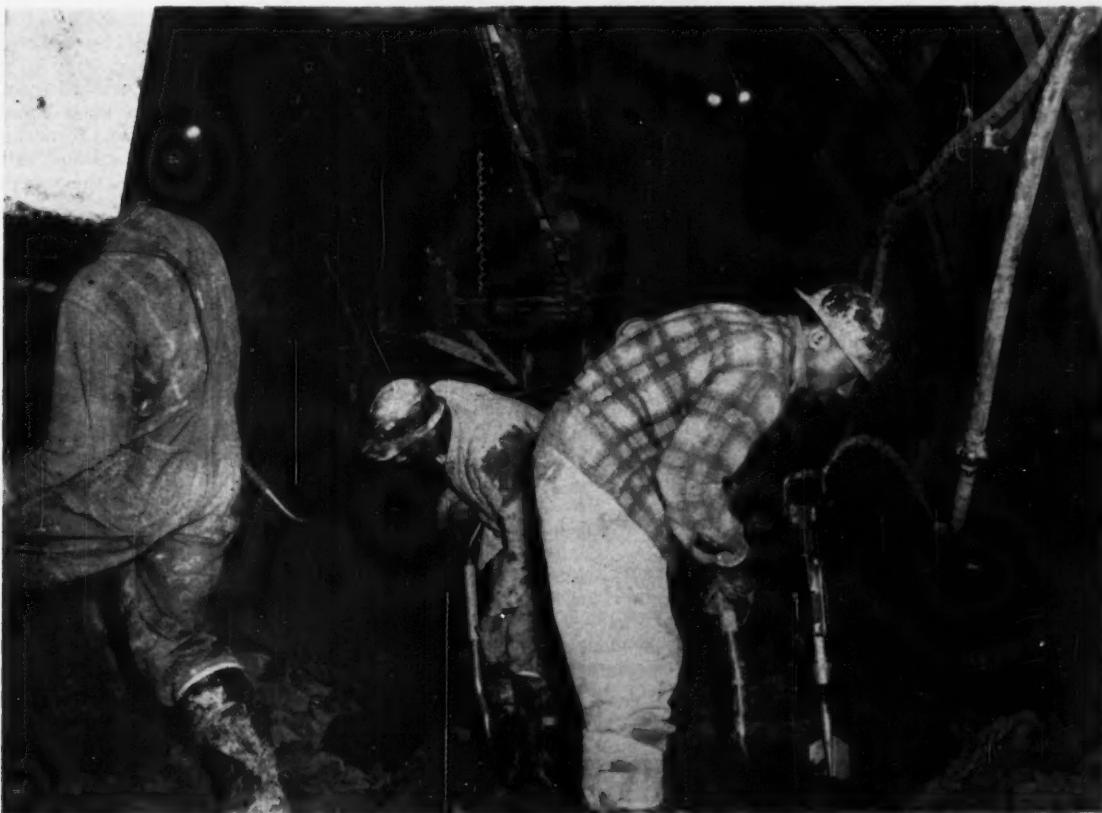
## **Tunnel 9,000 ft Long**

Doherty, a Chicago contractor, built its mechanical miner for a Cook County Highway Department job that called for driving more than 9,000 ft of semi-elliptical, concrete-lined tunnel in 180 days. While 5,400 ft is of the 10x11-ft size, three smaller bores are included. Substitution of the right diameter cutting wheel lets the mining machine dig these in stride, too.

The machine took 10 weeks and \$19,000 to build. One prime con-



**MACHINE MINING** — Tunnel face shows pattern of the digging-wheel's teeth as they shave away hardpan. Wheel turns at 5 rpm, 1 in. per revolution.



**HAND MINING**—Because the drain is semi-elliptical and the mining machine cuts a circular bore, invert must be lowered and haunches excavated by hand. The crew follows close behind machine, whose conveyor extends above and beyond to load-out muck.

## Contractor Builds Machine In His Shop

sideration in its design was that it had to be able to bore accurately to line and grade. This was achieved by making its longitudinal main frame a 20-ft length of 16-in.-dia seamless steel tubing with 1/4-in. wall. The tubing is fitted with six Dukes double-acting hydraulic rams, 4-in. bore and 12-in. stroke, that can "aim" it with pinpoint accuracy.

### Rams Hold Rig

Two of the rams are attached beneath front and rear of the tube and can support it to the tunnel invert for vertical alignment. The other four rams, in opposed pairs extending to either side, align the tube horizontally. They also act as reaction points to take the thrust of the jacks that move the machine ahead. To give them the necessary rigidity to resist this thrust, each ram is built into a telescoping cylinder of 7 and 8-in. seamless steel tubing with 1/2-in. wall. The outer end of each of these side-rams reacts against the lagging of the tunnel wall. The inner end frames into a steel box collar that encircles the tubular main frame.

### Collars Hold Frame

The tube is free to move longitudinally through the two collars, one for each pair of rams. For this, 1 1/2 x 1 1/2-in. steel angles are welded, legs down, to the quarter points of the tube for its entire length. The angles ride in sets of adjustable cam rollers in the collars. Thus friction is minimized yet the tube is held in rigid alignment.

All horizontal rams and their collars are framed together to act as a unit. And two 3-in.-bore, 36-in.-stroke Dukes rams connect unit and tube: They provide forward thrust to the tube and thus crowd the cutting wheel attached at its head end.

When the 36-in. stroke rams



**DIGGING TEETH**—Machine takes shape in contractor's shop where teeth are welded on. On job, they must be reversed after 4 hr, replaced each 8-hr shift.

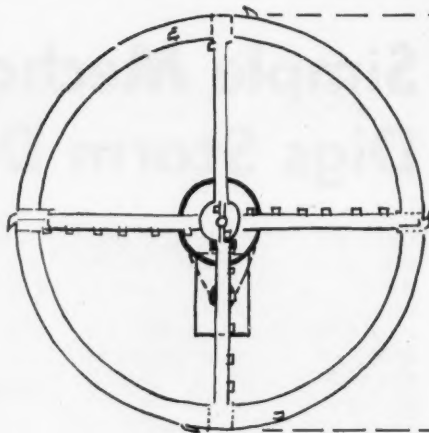
have advanced the tubular main frame and cutting wheel to the limit of their travel, the side-ram assembly has to be moved up in preparation for another shove. First the two rams on the bottom of the tube are extended to post the tube to the tunnel invert. With the cutting wheel, these hold the machine in place while the side rams are retracted. Then the 36-in.-stroke rams are retracted to pull the side-ram assembly ahead. When the side rams are extended to the tunnel walls, the mining machine is ready to go back to work again.

### Frame Houses Motors

With the exception of a Vickers hydraulic control panel, all apparatus for operating the rams is fitted inside the machine's 16-in. tubular main frame. It includes a 12-hp LeTourneau-Westinghouse electric motor that drives a Vickers pump, and a 5-gal tank for hydraulic fluid.

Also inside the tubular frame, at its head end, is a 60-hp L-W electric motor. Through an L-W gear box and chain final drive, this turns the cutting wheel at 5 rpm.

The wheel that cuts the 10-ft 4-in. bore consists of a 10-ft-dia skin-plate rim with spokes at the quarter points. The rim is made of 3/16 x 24-in. steel plate. It is stiffened front and rear,



**MINING MACHINE**—Built by contractor John Doherty Co., rig is powered by two LeTourneau-Westinghouse motors. An L-W 300-v 220-cycle generator on the surface supplies electricity for their operation.

respective, by 4 and 6-in. lips of 1/4-in. plate. Connecting the lips, and compartmenting the rim, are additional 3/16-in. plates on 2-ft centers.

Projecting 18 in. forward from the wheel hub is a steel cone. About 40 Cleveland trencher teeth welded to cone, spokes, and rim do the cutting as the wheel revolves.

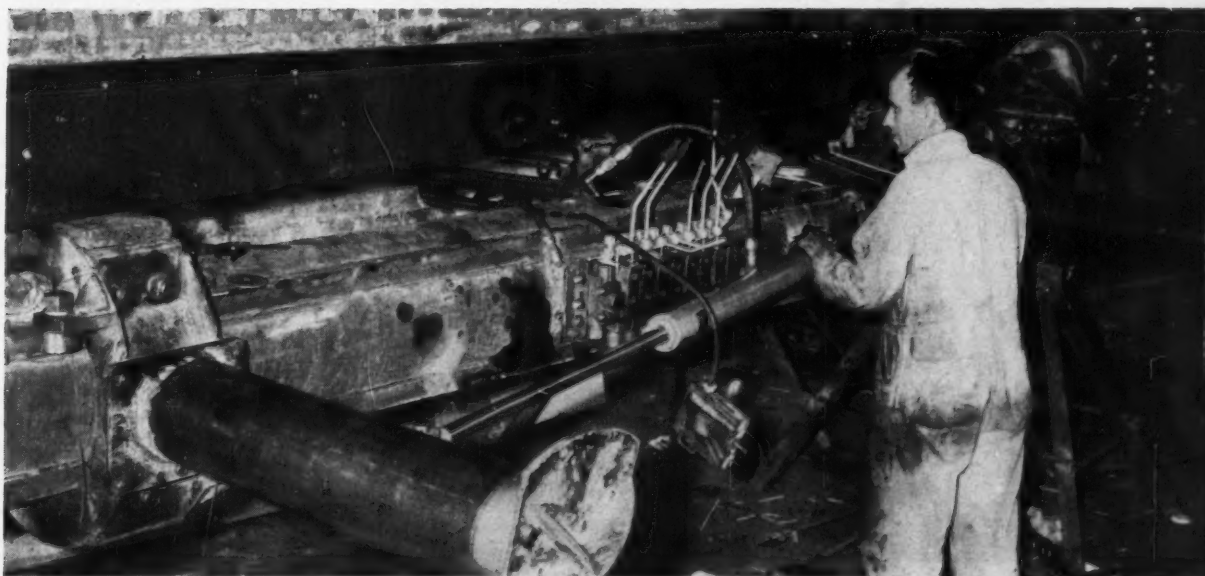
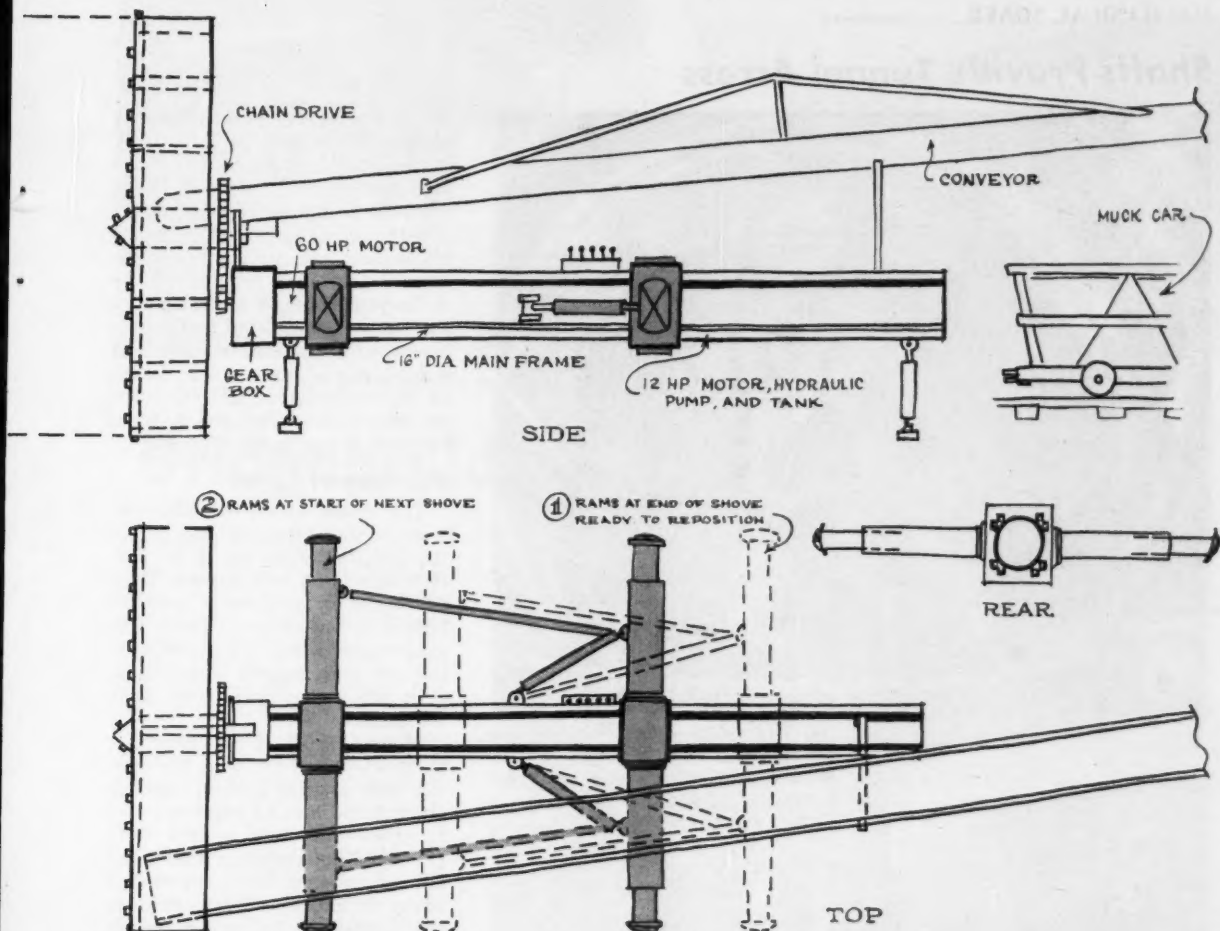
The center cone carries 15 teeth. And each wheel spoke is fitted with five or six teeth to cut an overlapping pattern. The spokes, which are 4-in.-dia pipe, are bolted into sleeves and can be turned to orient the teeth to the most effective cutting angle.

The wheel rim itself carries four teeth, one opposite each spoke. These extend 2 in. beyond the rim and give the wheel its effective cutting diameter of 10 ft 4 in.

### Teeth Shave Face

As the turning wheel is crowded into the face, the teeth shave off about 1 in. of hardpan per revolution. The muck falls inside the compartmented rim to be carried upward, as in a circular bucket elevator, and dropped onto an 18-in. Barber-Greene belt conveyor.

Hydraulically driven, the belt conveyor takes the muck 40 ft to the rear where it loads 2-yd mine cars. These operate on narrow-gage track and are handled



**MACHINE COMPONENTS**—At left is rear side ram and its collar, fitted with cam rollers, in which machine's tubular main-frame rides. One of the 36-in.-stroke crowd rams appears in front of the hydraulic control panel. At right is the digging wheel.

## Shafts Provide Tunnel Access



**IN THE HOLE**—Manhole shaft is dug only to top of tunnel, then machine mines through. Here it loads muck car. Tunnel alignment changes here, yet rig digs it easily due to its "aiming" flexibility



**OUT OF THE HOLE**—Bucyrus-Erie crane lifts 2-yd muck car out of shaft for dumping. Each foot of tunnel advance produces  $3\frac{1}{2}$  of muck, 3 yd of it mined by machine. The rest is mined by hand.

by a battery-powered Mancha Mule locomotive.

The storm drain is about 50 ft below ground, with 16-ft-dia manhole shafts at approximately 500-ft intervals. The shaft nearest behind the mining operation is used for muck removal. Here a Bucyrus-Erie 38-B crane lifts the muck boxes from the mine-car chassis and empties them in a spoil pile at the surface. Later an Allis-Chalmers HD-6G tractor shovel transfers muck from the pile to trucks for disposal.

### Ribs Support Tunnel

The crane and train also deliver tunnel ribs and lagging to the heading. Ribs are 6-in. 8.3-lb channels on 4-ft centers. They are installed as close as possible behind the mining machine's digging wheel, which is stopped during rib and lagging installation. Ribs are lagged solid with 2x6-in. planks.

Mining crew is 12 men per shift. Two of them trim the tunnel sides and set ground support. Behind the mining machine, two muckers and two miners with Chicago Pneumatic air spades excavate material from invert and lower haunches. That's because the semi-elliptical sewer design and circular machine-mined bore don't coincide. So hand mining accounts for  $\frac{1}{2}$  yd of the  $3\frac{1}{2}$  cu yd of muck taken out for each foot of tunnel advance.

The other six crew members are the mining machine operator, a miner beneath the machine dragging up train track, the locomotive operator, a signalman and crane operator topside, and a shift foreman.

### Job Goes Fast

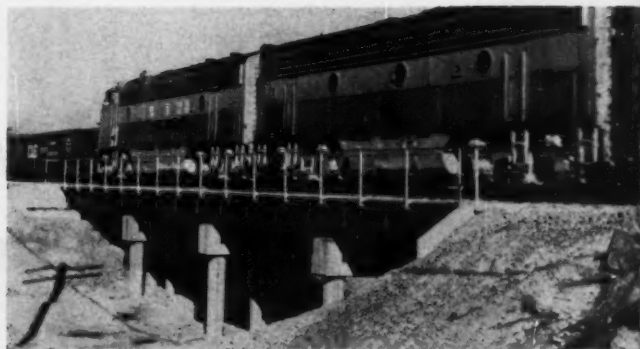
With this crew, Doherty advances the 10x11-ft semi-elliptical tunnel 40 ft in an 8-hr shift. A somewhat smaller section, paced by the machine carrying an 8-ft 4-in. digging wheel, advances 45 ft in 8 hr.

Master Mechanic Loren Scott, Vice President Harold R. Vogel, and other John Doherty Co. personnel planned and developed the tunneling machine. They were helped by, and much of the equipment was purchased from, Mayo Tunnel & Mine Equipment Co., Lancaster, Pa. John Rusnak is Doherty's job superintendent.





Old timber trestle comes down . . .



. . . new concrete bridge goes in.

## Bridgebuilding While Trains Roll

WITHOUT INTERRUPTING rail traffic, Western Pacific Railroad crews replaced a timber trestle near Stockton, Calif., with a prestressed concrete bridge.

The old timber trestle was near the end of its useful life, and the City of Stockton wanted a higher clearance over the flood channel of the stream that it crosses. So Western Pacific engineers designed a prestressed concrete trestle with 25-ft spans to replace the 15-ft timber spans.

Ben C. Gerwick, Inc., cast the prestressed members for the bridge at their Petaluma, Calif., yard and hauled them to the site. The piles were 20 in. outside diameter, hollow core units. The hollow girders spanning between pile bents were 28 in. square. Only cast-in-place concrete for the new bridge was abutments and pile caps.

A 50-ton rail-mounted Industrial Brownhoist crane with a Vulcan O hammer drove the piles. Rigged with moon beam and leads into which the pile hammer was inserted, the crane drove piles through openings cut into the timber deck.

Pile depth averaged 45 to 50 ft. Crews cut off the prestressed piles at pile cap elevation with paving breakers, powered by a small compressor, and burned off the prestressing tendons.

All preliminary work was done between trains. The rail-mounted construction equipment was backed onto a nearby siding just west of the site when it was necessary to clear the bridge for traffic.

Most critical phase of the job was replacing the timber deck



### REMOVING OLD BENTS—

Rail-mounted Industrial Brownhoist crane picks up a timber pile bent cut out to make way for new prestressed bridge with 25-ft spans.

### ERECTING NEW SPAN—

Workmen guide 28-in.-sq prestressed girder into position between concrete pile bents. Railroad did work with own crews, a span at a time.



structure and bents with concrete girders. This they did a span at a time. First they cut and hoisted out the timber stringers. Then they cut and removed the pile bents. The rails remained in place.

Each span required five of the 25-ft-long prestressed girders. After placing them between concrete bents, crews temporarily

blocked up the ties beneath the rails with stub ties.

Holes cast into the ends of the girders matched dowels cast into the pile caps. These connections were later grouted to provide positive anchorage.

Final operation after the structure was completed was placing an 8-in. layer of ballast on top of the concrete girders.

# Conveyor Feeds Trenched Material Back as Fill



*Contractor-built rig replaces haul trucks that usually take spoil around pipelaying operations, and deposits screened fines as backfill. Progress is 500 ft in an 8-hr day.*

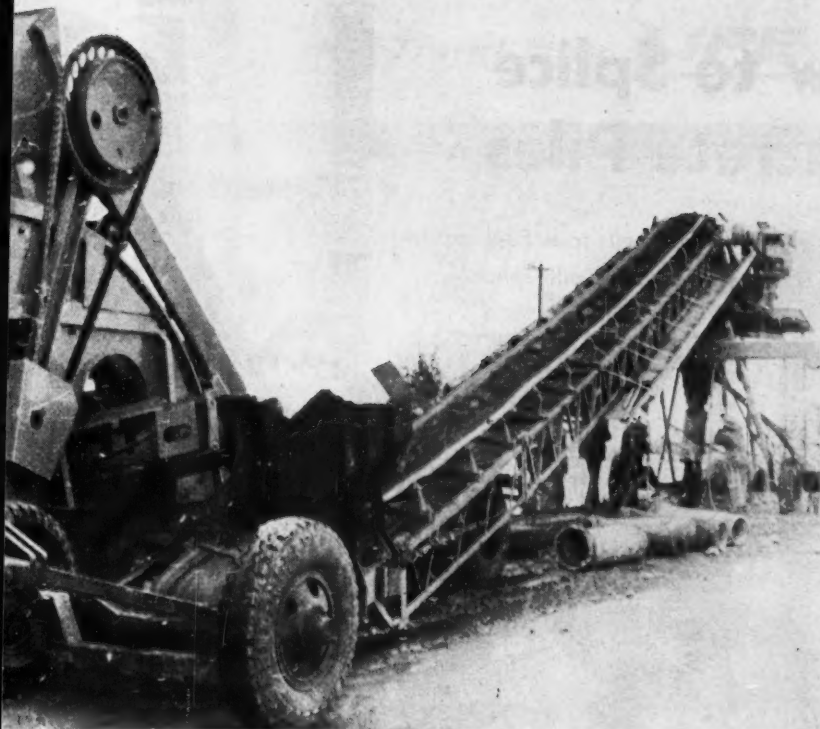
THE DITCHING MACHINE on an Idaho sewer job is a real workhorse: It digs the trench, drags after it a shield in which men lay pipe in safety, and pulls along a conveyor and screening mechanism that backfills the line.

The neat round-robin operation's biggest advantage is that it eliminates trucks for hauling dirt around. It also eliminates the usual large spoil pile along the open trench that puts extra weight on the ditch shoulder and restricts working space.

Morrison-Knudsen Co. worked

out the scheme for the Bench Sewer System project in its home town of Boise. The \$4 million job includes 92 mi of mains and laterals in sizes ranging from 8 to 36 in. M-K subcontracted part of the work to another constructor, but is handling 40 mi of it with its own forces.

The Idaho Concrete Pipe Co., of Nampa, is making most of the pipe for M-K's job. It is delivered in 4 to 10-ft lengths and in diameters from 8 to 18 in. The trench in which it is laid is 2½ to 6 ft wide at the bottom and 5



**HANDLING SPOIL** — Trenching machine feeds dirt to 60-ft-long belt conveyor, which it tows along with it. Sewer job in Boise proceeds during snowy Idaho winter.

to 25 ft deep. Soil is predominately earth overburden to a depth of about 6 ft. Below that is 1 to 2 ft of hardpan, then sand and gravel.

A Parsons Model 310 Trench-liner digs this material. The machine's cross-conveyor dumps excavated spoil onto another belt conveyor that carries it back beyond the point where pipe is being placed in the trench.

Built by M-K in its Boise shop, the spoil conveyor is 30 in. wide and 60 ft long. It is mounted on truck wheels and hitched to the trenching machine so the two advance as a unit.

The conveyor's rear wheels straddle the trench. And mounted above and between them is a 3x5-ft Kolman single-deck vibrating screen. The conveyor belt discharges excavated dirt onto the screen, which separates out  $\frac{3}{4}$ -in.-minus material. This falls to a hopper directly below, and from there an elephant trunk directs it as backfill around the pipe in the trench. Backfill is compacted by hand air tampers

fed by a Gardner-Denver 125-cfm compressor. Oversize material from the screen is chuted to a windrow at the side of the trench.

Originally a gasoline engine powered the conveyor and screen. But M-K changed to a Western Conveyor Co. 10-hp motorized head pulley and electrified the screen. A 20-kw generator mounted on the front of the trencher supplies power.

M-K later also mounted a trolley beam beneath the conveyor and fitted it with a  $\frac{1}{2}$ -ton Coffing hoist for handling the heavier pieces of pipe. Formerly an Austin-Western hydraulic crane lowered them into the trench.

To protect the two men laying pipe in the trench, the underside of the conveyor is fitted with a skirted catch board that deflects any spillage. And the men work within a sectionalized safety shield that the trenching machine drags behind it. Made of steel with hinged timber cross braces, the shield is 16 ft long and 3 ft wide. Shield sections 4 ft high are bolted atop one another for a maximum total shield height of 16 ft.

With its round-robin scheme, M-K has laid and backfilled as much as 500 ft of 15-in. pipe in an 8-hr day. That's for a 12-ft-deep trench. Maximum progress to date has been 125 ft in 1  $\frac{1}{2}$  hr.

**PLACING PIPE** —Hydraulic crane fitted with hairpin hook lowers length of concrete pipe to two men in trench, who work within protection of a steel safety shield.





# How to Splice Concrete Piles

*A plasticized cement that melts to a fluid consistency and sets quickly makes a sound pile splice.*



**DRILL**—Workman drills holes in top of driven pile for rebar dowels protruding from bottom of pile buildup.



**POSITION**—Crane swings pile buildup into place over driven pile. Steel boot helps align pile sections.



**POUR**—Workman ladles melted plasticized cement into spouts in boot.



**STRIP**—In 15 min the plasticized cement hardens to a compressive strength as high as 6,000 psi, and the pile is ready for further driving.

A QUICK-SETTING plasticized cement speeds splicing of prestressed concrete piling. The compound sets in 15 minutes and makes a splice that is stronger than the pile itself.

C. W. Blakeslee & Sons of New Haven, Conn., developed the quick splicing method jointly with Chargar Corp. of Hamden, Conn., who market the cement under the name Florok's Plastiment.

Blakeslee used the new product to good advantage in construction of the Atlas Shopping Center at Milford, Conn. The job called for driving about 40,000 ft of 12-in.-sq prestressed concrete piles. Depth to rock varies from 40 to 80 ft, and that meant numerous pile splices.

Here's how Blakeslee's crew handles the splicing operation. A crane swings a 20-ft-long pile buildup into position on top of the driven pile. Workmen guide the pile buildup as the crane lowers it so rebar dowels protruding from its bottom end fit into holes in the top of the driven pile. The

dowels consist of four No. 6 reinforcing bars spaced in a square within the prestressing strands.

Dowels are embedded about 12 in. in the pile buildup; they protrude 24 in. into the holes in the driven pile. These holes are either drilled on the spot or cast in the pile with flexible metal tubing. Diameter of the holes is 1 1/4 in. The surfaces of both pile buildup and driven pile are roughened to increase bond at the splice.

Then the crew clamps a 3-ft-long steel boot around the splice, centering it so top and bottom are about 1 1/2 ft from the splice. The boot aligns the pile sections and leaves a 1/2-in. gap between them. Spacers on the inside of the boot hold the sections apart. The boot also serves as a form for the quick setting cement.

The cement comes in 4-in. block briquets. The crew heats the briquets over a slow fire in an oil drum until they melt to a light fluid consistency at a temperature between 265 and 290 deg. A workman ladles the melted

cement into spouts cut into the splice boot at each side. It pours easily, filling the gap between pile buildup and driven pile. The fluid also fills the remaining space around the dowels in the holes in the driven pile.

The cement sets rapidly, reaching a compressive strength of 5,000 to 6,000 psi in about 15 minutes. After removal of the steel boot, the spliced pile is ready for further driving immediately.

Blakeslee conducted a series of field tests to check the soundness of the splice. They subjected a spliced pile driven to refusal to 300 blows of a Vulcan No. 1 hammer. Inspection showed no cracks in splice. In another test, they struck 100 blows on a spliced pile driven to refusal, then fixed a line 10 ft above the splice and pulled on it with a winch—the pile broke below the splice, with no visible effect on the hardened plasticized cement. A wrecking ball swung against another spliced pile again broke the pile but not the splice.



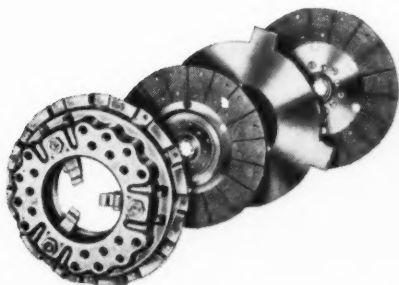
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## Moves 65,000 yards of dirt a day for jet-age new runway at **GULF MAKES THINGS**

Nashville, Tennessee is making way for the jet age with a whopping \$6,500,000 airport improvement program. As part of that program, Gregory-Burns-Waters Company, joint venture contractors, are moving 5,000,000 cubic yards of dirt for a new 10,000-ft. runway. And they're moving it at a rate of 65,000 yards a day!

To stay on schedule, each pan must average 95 trips each 10-hour shift, hauling more than 25 cubic yards of dirt per trip. Trip distance—up to 9,000 ft. A battering, gear-grinding pace? Sure. But the contractors know

their equipment, and know how to shave downtime to a minimum. They're lubricating every piece of equipment on the job—between shifts—so that no time is lost in preventive maintenance. And, they're using this combination of Gulf fuels and lubricants that have job-proved themselves over the years; Gulf diesel fuel, Gulf Super Duty Motor Oil, and Gulflex A lubricant.

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Rough, hilly terrain was gouged, scraped and filled to become a 10,000-ft. runway. It required movement of 5,000,000 cubic yards of dirt. Fourteen pans averaged 95 trips during each 10-hour shift.



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Left to right: Charles (Buddy) Gregory, J. B. Long, Gulf Sales Representative, Isham Gregory, James (Jimmy) Gregory, and Bill Taylor, Gulf Sales Representative. You can always rely on Gulf for on-the-job service.

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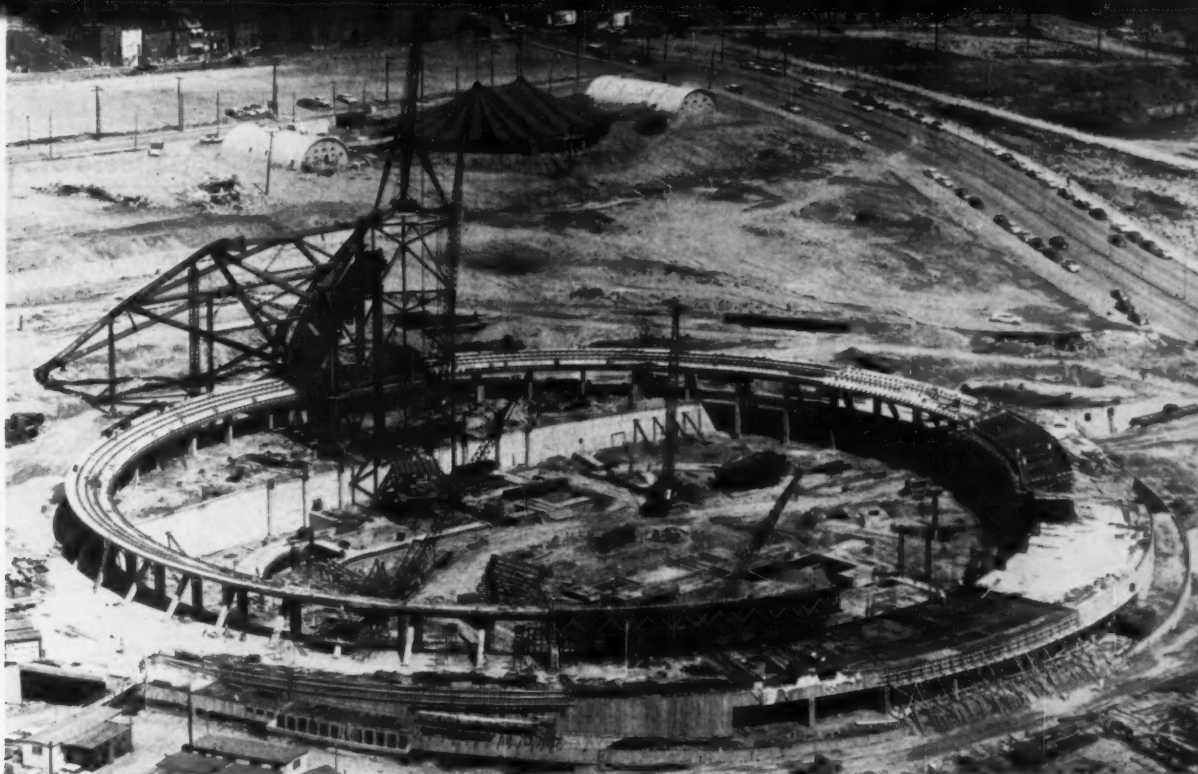
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## Retractable Dome Will Hang From Long Cantilever Arm

*A 260-ft curved cantilever arm will hold the leaves of the retractable dome over Pittsburgh's new Civic Auditorium.*

ONE CRISP MORNING this winter an American Bridge Co. erection crew pinned into place a 45-ton weldment capping the end of the curved steel cantilever arm that will support the retractable dome roof of the Pittsburgh Civic Auditorium. It marked the halfway point in steel erection for the unique structure.

Delayed for four months last year by the steel strike, the erectors now are trying to make up for the lost time. They expect to complete erection of the 3,500 tons of steel that will go into the roof structure by the end of next month. That will make way for meeting the target date for opening the auditorium in June, 1961.

The 415-ft-dia dome consists of two fixed leaves and six movable leaves that will rotate about

pivots at the end of the supporting cantilever and roll back, three on a side, to open the auditorium to the sky. Riding on rails on top of the 1/4-mi-long ring girder circling the structure, the leaves will nest together, one on top of another, over the fixed leaves on either side of the cantilever.

A trussed steel tie-back made of box girder sections and anchored by two massive blocks of concrete 110 ft back from the abutment at the base of the cantilever will hold the projecting arm. The cantilever arm and the two main legs of the tie-back truss form an inclined tripod from the tip of which hangs the dome.

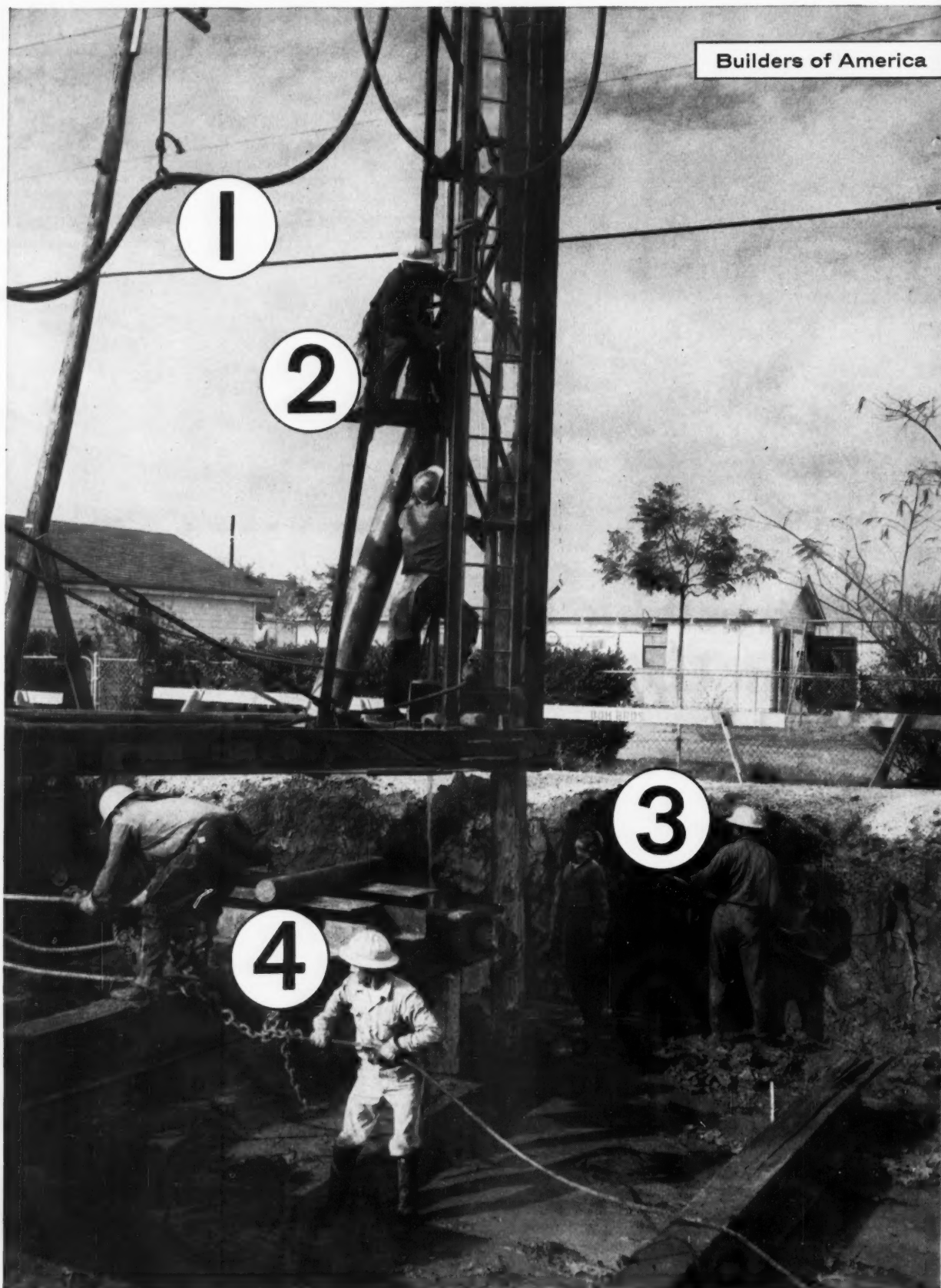
The cantilever arm is a double box section 8 ft wide and 17 ft deep. Measuring about 260 ft along its arc, the arm juts out into the auditorium about 205 ft from its base. It rises about 136 ft above its base. The seven double box sections of which it is made up weigh 1,400 tons.

One of eight prime contractors sharing the work on the \$20-mil-

*continued on page 112*



**FINAL PIECE**—Tower supported derrick places 45-ton weldment at tip of cantilever.



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## Just driving piles— but think of the injuries if . . .

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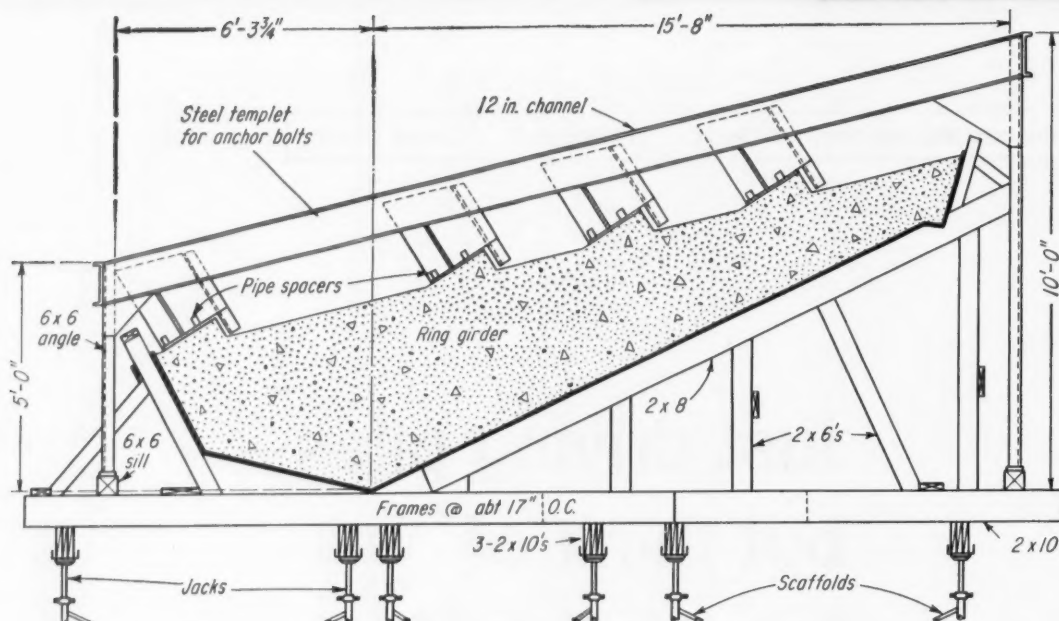
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## Prefab Forms, Steel Templet Speed Concreting

### RETRACTABLE DOME ... *continued*

lion project, Dick Construction Co. of Large, Pa., holds the contract for excavation and concreting. They opened up the job in April, 1958, and spent most of the summer digging out 330,000 yd of clay, shale, and old foundations to make way for the substructure of the building.

Before starting on concrete work above ground, Dick had to build a maze of tunnels that will accommodate heating and air conditioning ducts, water lines, and electrical conduits. Length of the tunnels totaled 1,500 ft.

Forming and pouring the 50-ft-wide podium slab that circles the structure and forms a promenade deck outside the dome was the first step in building the above ground portion of the building. Crews placed  $\frac{5}{8}$ -in.-thick plywood panels on top of 4x4-in. timber joists spaced at 2 ft. The timber joists span between steel Spanalls held by 4x4-in. timber shores at 4-ft centers in both directions. Ellis shore clamps connect the shore sections, which extend to a height of about 16 ft above the first or ground level of the auditorium.

Concreting of the 10-in.-thick podium slab took place for the



**RING GIRDER**—Crane with 2-yd laydown bucket places concrete in prefab forms for 104-ft section of ring girder. Steel templates fit over forms to hold anchor bolts for rails.

most part in the winter. Heat from oil-burning salamanders placed under the forms kept the concrete from freezing. Tarpaulins hung from the edges of the slab enclosed the area beneath and kept out cold air. After the pour workmen placed insulating bats over the freshly placed concrete and covered it with tarps.

While stripping the forms, Dick removed the timber shoring beneath the slab and replaced it with standard tubular steel scaffolding. This scaffolding supports the slab and takes the load from the falsework placed on top of it to hold forms for the ring girder.

Concrete A-frames consisting of a vertical column and an inclined column support the 20-ft-wide ring girder at about the third level of the structure. Founded on

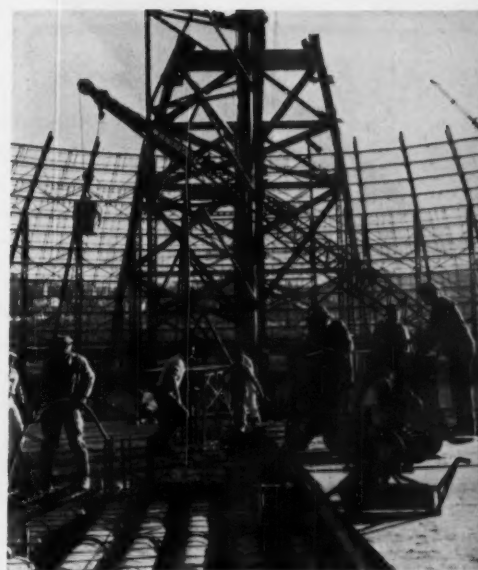
spread footings, the A-frames are spaced at 26-ft centers. A 1-in. expansion joint at every fourth frame separates the ring girder into 104-ft-long sections.

The ring girder is irregularly shaped in cross section, with a 13-deg sloping top and a trough-shaped bottom. Maximum depth of the girder is about 4½ ft. Concrete haunches on top hold the rails that serve as tracks for the movable leaves of the dome.

Dick built two sets of forms for the ring girder. Each set forms a 30-deg section spanning four bays, and consists of two 10-ft-long sections and a 4-ft center section for each of the four bays. The 2-ft-wide strip at each supporting A-frame is formed by hand.

Beaver - Advance scaffolding





**POURING**—Self-propelled 1/2-yd buggy delivers concrete to crew pouring slab.

**FORMING**—Cylindrical cardboard tubes set on plywood forms leave voids in slab.

supports the prefabricated form units. Two scaffold towers seated on the podium slab and a third tower set on the ground inside the circle support the trussed frames of the form units. Timber mats made of 8x8's placed on a granulated slag base prevent settlement of the towers.

Jacks at the top of each scaffold leg level the prefab forms. The jacks support laminated timber beams made up of three 2x10's that run parallel to the girder and hold the form frames. Radial joists consisting of 2x10's on about 17-in. centers form the base of the frame. Several 2x6 struts on top of each joist hold a slanting 2x8 on the wider side of the trough-shaped bottom. On the shorter side braces hold the inner fascia form panels and bottom panels in place. No forms are required for the gently sloping top of the girder.

But the steel contractor supplied special steel templet frames to hold the sloping anchor bolts for the track rails. These fit over the form frames and insure accurate positioning of anchor bolts.

American Bridge fabricated eight templet frames, enough to hold the anchor bolts for one

four-span pour. Angle iron posts at each corner of a templet frame hold four slanting 12-in. channels over the sloping top of the ring girder. Spacing of the radially aligned channels varies from about 2 ft, 8 in. at the inner edge to about 3 ft, 2 in. at the outer edge of the ring girder.

Steel plates welded to the web of the channels hold inclined plates punched with four holes to hold the bolts. Paper sleeves inside the steel pipe spacers welded over the holes hold the bolts securely at the correct angle. Another steel plate forms the inclined face of the concrete haunches, and timber forms hung from the channels form the top of the haunches.

Dick poured the ring girder in 12 full sections plus two smaller sections at each end on either side of the cantilever arm. They worked around from the cantilever arm on both sides, averaging a pour every 2 1/2 weeks. It took about four weeks to prepare a section for a pour. Concreting usually took a full day. Each section took 250 yd of concrete.

On most pours two cranes, one inside the ring girder and one outside, teamed up to place

the concrete, which transit-mix trucks delivered to the site. Each worked with 2-yd laydown buckets. They started at the center of a four-span section and worked concrete into place in concentric circles spreading out like contour lines from the inner edge.

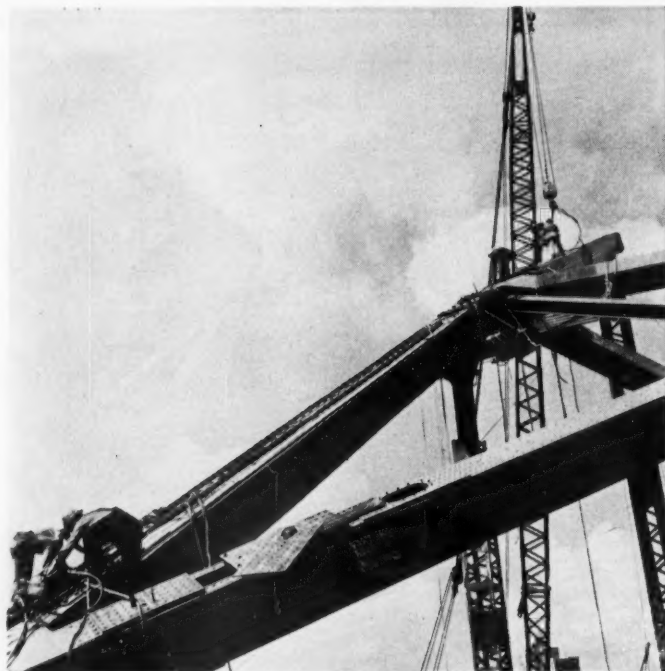
Specs called for high early strength concrete to permit stripping within 48 hours. Plastiment added to the 5.4-bag mix prevented formation of cold joints during the pour and later aided form release. Cylinder tests show an average concrete strength of 4,000 psi after 28 days.

Dick stripped the ring girder forms in two sections, usually on the second day after the pour. First crews lowered the jacks supporting the prefab form frames and pulled out the inner fascia panels. Then a crane pulled out the 10-ft-wide frames from beneath the wide sloping bottom on the outside of the ring girder. The contractor left the 4-ft-wide section at the center of each 24-ft span in place to prevent excessive deflection.

Now work is progressing on the three levels of concrete stands going up within the ring girder. Steel pans form the tiers of con-



**SOARING STEEL**—Erection crew nears completion of the double-box girder cantilever arm that, anchored by tie-back truss, juts 205 ft from its base to hold the leaves of the retractable dome.



#### RETRACTABLE DOME . . . continued

crete slabs that will hold more than 9,000 permanent seats. A team of  $\frac{1}{2}$ -yd power buggies places the bulk of the concrete. Altogether the job will require about 35,000 yd of concrete.

Richvoid tubes form voids in the deck slabs providing access to the tiers of seats. Altogether Dick is using 44,000 ft of the tubular cardboard cylinders.

#### Steel Erection

The American Bridge erection crew moved onto the job last April. They started erecting the massive cantilevered arm by putting into place the 68-ton base section, heaviest single fabricated section, on its concrete abutment. Two Manitowoc cranes, a 3600 with 110-ft boom and a 3900 with 120-ft boom and 30-ft jib, handled erection of this piece and the next two sections of the girder.

In the meantime another crew put up the 125-ft tower that supports a 50-ton guy derrick. Each side of the triangular tower measures 35½ ft. The tower moves back and forth, parallel to the cantilever arm but slightly to one side of it, on a pair of tracks that extend 120 ft from about the center of the auditorium to within about 30 ft of the base of the cantilever. Gage of the tracks is 30 ft, 8 in. Two massive counterweights made up of four steel in-

gots and weighing about 2,200 lb project from the rear of the tower.

The derrick on top of the tower is fitted with a 40-ft mast and a 90-ft boom. A Clyde three-drum hoist powers the derrick. Two hoists at the base of the tower swing the derrick. Lead-line pull capacity is 20,000 lb. A winch or crane, when available, pulls the rig along the tracks.

As the cantilever arm grew in length, section by section, American Bridge added telescoping steel bents, each consisting of two posts connected by trussed bracing, to support the jutting cantilever.

While completing the cantilever, erection crews started placing steel for the two fixed leaves on either side of the arm. Next step will be placing steel for the movable leaves that roll back to nest over the fixed leaves when the dome is open.

Each of the leaves forms a 45-deg segment of the retractable dome. Length along the arc at the base of each leaf is 165 ft. Seven 30-in WF beams form the ribs of each leaf. Purlins consisting of 8 and 10 in. channels hold the stainless steel sheathing that will cover the dome.

American Bridge plans to erect the movable leaves a pair at a time. Each leaf will be erected adjacent to the fixed leaf on either side of the cantilever, then rolled

back to make way for erection of the next leaf.

Two cranes—one on either side of the auditorium—seated on the podium slab will handle erection of the steel in the lower portion of each movable leaf. A third crane located outside the ring girder will carry steel from stockpiles to within reach of the erecting rigs. The upper portion of the leaves, near the top of the dome, will be erected by the traveling guy derrick.

During erection a single 2-ft square trussed steel post shores each rib of a leaf. When erection is complete and the tip of the section is tied into the pivot at the tip of the cantilever, the telescoping post will be removed so the leaf can be rolled back over the fixed leaf on that side.

#### Organization

Just as interesting as the many difficulties inherent in building such an unusual structure is the organizational setup on this project. The resident engineer representing the Public Auditorium Authority and the architect and consulting engineer doubles as the construction superintendent. His principal job is coordinating the work of the eight different prime contractors handling the various phases of the project. In effect he's the general contractor.

*continued on page 116*

# The Cat No. 12 Motor Grader: Tops in its class on any road!



No matter what the type of road or road work, you can count on top performance at low operating cost from a No. 12. On country roads and cross-country highways, this rugged machine has earned its reputation as "The Standard of the Industry."

Here, for example, a No. 12 is working on a stretch of interstate construction near Buchanan, Virginia. Says Superintendent Robert O. Shook of the Nello L. Teer Company, Durham, N. C.: "From my experience with various motor graders I am convinced that the No. 12 is tops in its class. We can get more work out of a No. 12 because it gives us less maintenance trouble—it stays on the job with a minimum of down time. We also get excellent service from our Caterpillar Dealer."

Many factors make the No. 12 a big producer. Here are some:

**MECHANICAL CONTROLS** (standard) provide precise adjustment, reduce kickback, ease engagement. "Anti-creep" lock makes blade stay put under load.

**UNEQUALED VISIBILITY** results from the No. 12's dash-mounted lift gears and low frame design. While seated, the operator has an unobstructed view of the critical areas at the front wheels, toe of blade and circle.

**EXCLUSIVE OIL CLUTCH** provides up to 2,000 hours' service without adjustment, the equivalent of about 12 months of "adjustment free" operation. Virtually eliminates down time for clutch repair.

**OPTIONAL AUTOMATIC BLADE CONTROL** is an attachment that cuts grading time in half. Operator sets desired slope on dial and only has to control depth of cut. Now transistorized for freedom from maintenance and adjustment, the unit automatically maintains blade slope within  $\frac{1}{8}$ " in 10'. Fine for *all* types of grading.

See the improved No. 12 at your Caterpillar Dealer. Whatever the job, he has the right capacity motor grader for it. Besides the 115 HP No. 12, there's the big new 150 HP No. 14 and the 75 HP No. 112. Ask for a demonstration.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

## CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**LESS DOWN TIME,  
MORE PRODUCTION...  
CAT MOTOR GRADERS**



## RETRACTABLE DOMES . . . continued

H. Rey Helvenston is the man handling this once-in-a-lifetime job. Qualified by more than 30 years of construction experience, some of it running his own contracting firm, he keeps the contractor's viewpoint constantly in mind. He demands a good job, but he's always trying to help the contractor get the job done faster and more efficiently. His aim is to push the job to completion ahead of schedule. Each day

shaved off the construction schedule means a saving of at least \$1,200 in interest charges to the taxpayers who are footing the bill.

Helvenston keeps his finger on just about every detail of the job. He holds weekly conferences with the superintendents directing the work of each contractor. He makes sure they work side by side effectively without getting in each other's way.

At the meeting he takes each

man in turn and asks: "What's your problem?" Each superintendent brings forth any objection about how the operation under discussion will affect the work of his crews. Then they explore alternatives and finally Helvenston gets them together on a decision. In this way they schedule operations in advance and keep the project rolling.

But Helvenston's role in coordinating the work of the contractors only begins in the conference room. He's on top of the job every minute of the day. A comprehensive field-office communications system keeps him in touch with all key men on the job. Controlled by a man in his office, the system includes 12 call boxes scattered around the job within easy reach of all work areas.

When a super or foreman wants to talk over a problem with someone else, he picks up the phone at one of the handy call boxes and gets the operator in the office to buzz that man on the call system. Each of the 20 key men on the job has his own personal call signal.

And more than one man can get in on the conversation if need be. Frequently Helvenston holds three-way telephone conferences. He gets reports from men on the spot and discusses them with the architect or engineer, with whom he is linked by telephone.

Another thing that helps in coordinating the operations of the different contractors is the use of combined plans that show on one drawing or print all the utilities that will go into a particular part of the structure. With the help of these drawings each contractor can plan his operations in an orderly sequence and avoid interference with other contractors.

### Men on the Job

Superintendent for Dick Construction Co. is Joe Alcorn. W. R. Holmes is superintendent in charge of steel erection for American Bridge.

Mitchell & Ritchey, Pittsburgh, is the architect. Amman & Whitney, New York, consulting engineers, designed the ring girder and the retractable dome. Robert A. Zern of Pittsburgh designed the completely independent structural unit holding the stands within the ring girder.

**MARQUETTE'S**  
*Star-Jet*  
**"CUSTOM"**  
**OUTFIT**

**MARQUETTE'S**  
*Star-Jet*  
**CUSTOM**

**new low cost**  
**full capacity**  
**welding**  
**and**  
**cutting**

**\$99.50**

**PRICE, COMPLETE FOR THE**  
**STAR-JET CUSTOM WELDING**  
**AND CUTTING OUTFIT**

Outfit Includes: one Star-Jet Torch Handle; three Welding Tips, sizes 1, 3, 5; one Cutting Assembly with Tip; one full-sized Oxygen Regulator; one full-sized Acetylene Regulator; 12½ ft., 3/16" Double-Line Hose; Welding Goggles; and Torch Lighter. In addition, a full range of other sizes and types of tips are available.

Here's your perfect opportunity to replace worn oxy-acetylene welding and cutting equipment—or add new. Save time and labor, performing hundreds of repair shop jobs faster and easier. Marquette's Star-Jet Custom is a medium sized, full capacity torch with top quality features usually provided only by those selling for up to ½ more.

For example: "O" ring seals permit rotation of tip to any desired position *without* removing from handle. Efficient, long-cone flame is easily controlled, directs heat exactly where needed.

Ruggedly built to withstand rough usage for years of service-free welding, cutting and heating.

# MARQUETTE

MARQUETTE MANUFACTURING Co., Inc., 307 East Hennepin Ave., Minneapolis 14, Minn.





## After 20,000 hours of trouble-free power "Old Faithful" retired by new UDT-817!

An International UD-24 engine—called "Old Faithful" by her owners—has racked up 20,000 hours of continuous trouble-free performance on a rock crushing job in Kansas. That's an average of nine hours per day for six years! At 13,000 hours a gasket had to be replaced, but there have been no major repairs. The operation, owned by Roy Baker of Valley Falls, produces 900 cu. yds. of crushed rock daily with a 32 x 40 Universal crusher.

Partners in the company, Mike and Bert Baker, say, "We decided to retire our old faithful UD-24 after it had piled up nearly 20,000 trouble-free, hard-working crushing hours. The new UDT-817 was chosen because of its greater power, direct starting and easy installation. Fuel consumption on the 817 is low, considering the power we get. And with all that power we can eliminate secondary crushing by just reducing the jaw opening."

Roy Baker says, "Of course I bought another

International!" And that about sums up the attitude of contractors all over the country—they know from experience that Internationals stand up under heaviest work, are immune to dust and grit—and will pay back the investment faster than any other.

Check with your International Engine Distributor or Dealer soon, and find out how little it costs to power—or repower—your equipment with International engines. See the full line of engines and power units—16.8 to 385 max. hp.

**INTERNATIONAL<sup>®</sup>**  
**HH ENGINES**

International Harvester Co.,  
180 North Michigan Ave., Chicago 1, Illinois  
A COMPLETE POWER PACKAGE



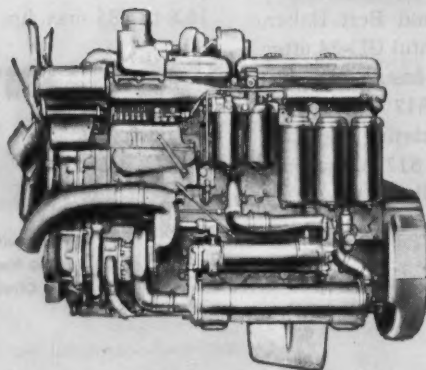
Keep full loads on the move full time with exclusive Planet Power-steering. Full power on both tracks, full time, is the answer! And Hi-Lo on-the-go power-shifting lets you match power to condition, instantly, and keep the yard-boosting advantage of uninterrupted momentum.

You speed-up all four steps of the push-loading cycle with TD-25 torque-converter and planetary system teamwork! 1) You slow down by power-shifting down and using decelerator to get feather-touch contact; 2) power-shift either track up or down to maintain solid pusher contact on curves; 3) get gear-higher kick-outs, with on-the-go power-shifting; 4) reposition faster, with higher-than-ordinary reverse! Two "25s" tandem-pushing the International 295 Payscraper®, and the third, scarifying, belong to contractor Ed Bentley, Sylacauga, Alabama — building superhighway near Birmingham.

**PLANET**  
**Power-steering...**  
**HI-LO**  
**power-shifting...**  
**COME AS**  
**standard equipment**  
**ONLY**  
**in the new TD-25**



The International DT-617 engine—single power source used in both pushers and scrapers—an industry first in power standardization. You'll find this big new direct-start, 6-cylinder turbocharged diesel powering the full line of International two and three-axle Payscrapers; Paywagons®, and end-dump Payhaulers.® Plus the new TD-25! Dual valving of this high-torque, 230-hp power plant provides for peak turbocharging efficiency, to develop full power from sea level to timberline!



**As standard equipment at no extra cost**, the new 230-hp TD-25 gives you the International®-proven control combination that has been beating king-sized clutch-steered crawlers in yardage for years!

You get combined Planet Power-steering and Hi-Lo on-the-go, power-shifting exclusively in the new International TD-25. And you get this basic, built-in design advantage in your choice of torque-converter or synchromesh model!

With this and all its other big advantages, the TD-25 can outearn other big rigs up to 50%—on push-loading; and pulling big drawbar tools such as shale-shattering scarifiers!

**No "dead-track drag" or "gear-shift lag"!**

Planet Power-steering gives you full-time "live" power and traction on both tracks, to make full-load turns—and to eliminate load-limiting "dead-track drag." And

Hi-Lo on-the-go power-shifting instantly matches power to conditions to prevent load-losing "gear-shift lag."

Hi-Lo power-shifting makes the TD-25 the industry's only 4-speed torque-converter crawler and the only one with load-matching efficiency-range control. In the synchromesh transmission "25," the Hi-Lo planetary system gives eight speeds forward and reverse—with cycle-speeding, up-or-down, on-the-go power-shifting with "finger-tip" ease!

**Power-shift and power-steer** the new "25" with full king-size loads—around curves, upgrade, anywhere. Prove what it means to command full-time, full-load ability to outearn clutch-steered king-sized crawlers, up to 50%. Measure all the "25's" standard equipment extra value features! See your International Construction Equipment Distributor for a demonstration!



## *International® Construction Equipment*



International  
Harvester Co.,  
180 North  
Michigan Ave.,  
Chicago 1, Ill.

**A COMPLETE POWER  
PACKAGE:** Crawler and  
Wheel Tractors... Self-  
Propelled Scrapers and  
Bottom-Dump Wagons...  
Crawler and Rubber-Tired  
Loaders... Off-Highway  
Haulers... Diesel and  
Carbureted Engines...  
Motor Trucks... Farm  
Tractors and Equipment.



# *Take your choice of jobs..*



**Take grading, stripping, and spreading jobs**—including those that formerly required costly specialized machines and separate operators! Four-in-One "carry-type scraper" action lets you shave off layers of earth or sod with inch-close accuracy—and lets you precision-spread soil on-the-go. Note how 4-in-1 scraper action "boils" the bowl full, grading for a sidewalk on a new street!

**Take over sticky materials loading jobs** that stop ordinary "roll-forward" buckets cold! Opening the clam pulls the material from bucket surfaces—gravity pull does the rest—to assure positive dumping and positive self-cleanout, even of wet, sticky, clay-type materials! Your sticky materials problem is over with the 4-in-1 as this 2¼-cu. yd. TD-15 proves!






# ...and "take" your competition

## ...WITH EXCLUSIVE


# 4-in-1

## CLAM-ACTION...




**You can take slam-bang jobs**, like old pavement removal, from far costlier boom-type rigs—using International Drott 4-in-1 power-shovel-like excavating force. See how this 3-cu. yd. TD-20 Four-in-One digs up reinforced concrete slab, tons at a time—applying up to 43,150 lbs. of famous pry-over-shoe break-out power!

See how industry-topping 4-in-1 work capacity—plus the tremendous work range of its built-in "equipment spread" of machine actions—equips you to take your choice of jobs!



Move the "job-action selector"—prove 4-in-1 ability to "take" competition—be it "single-action" loader, or a yard-full of other limited duty rigs. Compare exclusive shock-swallowing Hydro-Spring advantages, for positive performance protection. Let your International Drott Distributor demonstrate the 4-in-1 size you need. **Five big-capacity sizes:**  $\frac{3}{4}$ ,  $1\frac{1}{8}$ ,  $1\frac{1}{2}$ ,  $2\frac{1}{4}$ , and 3 cu. yd.!



**"Take" your bulldozer competition** with 4-in-1 'dozer action—which can duplicate the performance of a full-sized blade in capacity, work range, and accuracy of control! Here, an excavating contractor is rolling the earth with his  $1\frac{1}{2}$ -cu. yd. TD-9 Four-in-One's bulldozer action on landscaping work! Operator regulates dozing depth accurately with hydraulic "radius control!"

International Harvester Company, Chicago 1, Illinois  
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



# INTERNATIONAL

# DROTT

Walker Cut Stone Co., Milford, Kansas, replaced six smaller overworked gasoline haulers with only two 19-ton Model 65 Payhauler trucks! Their "65's" deliver 150 tons of limestone per hour, from quarry to crusher.

# How new rock-ribbed 65 Payhauler® pair



## speeds "write-off," replacing six smaller rigs!

—for Walker Cut Stone Co., Milford, Kansas

**Two new International 19-ton 65 Payhauler trucks**—with the new weight-saving corrugated bodies, and the new 250-hp D-817 diesel engine—have replaced six smaller gasoline trucks for Walker Cut Stone Co., Milford, Kansas.

Results are amazing! Only two operators instead of six to pay! Only 40 gallons of low-cost diesel fuel used daily (total) by the two Payhauler rigs—against several times 40 gallons of high-priced gasoline formerly swilled by the carbureted outfits! And only two machines to maintain, instead of six! "Write-off" of the Payhauler investment speeds in "high gear!"

### Payhauler features increase capacity!

Even against competitive haulers of similar rated

capacity, the new 65 Payhauler gives you overwhelming advantages!

Of all off-road haulers in its size class, only the 65 Payhauler has the International-developed rock-ribbed corrugated body! This strength-multiplying principle lets the "65" shed 5,000 lbs. of power-wasting weight, and gain a full ton of payload capacity.

**Prove the power-to-payload advantages** the new rock-ribbed 65 Payhauler delivers! Compare the "65's" cycle-speeding combination of air-assist shifting; 11-second dumping, fast reversing; super-power braking; bonus-leverage, vibration-free power steering! And for 27-ton capacity, note how the 375-hp "95" leads the field. See your International Construction Equipment Distributor for a demonstration!

**In only 11 seconds you dump the "65's" 19-ton load**—with 3-stage, double-acting, constant-power hoist! Positive up-and-down snubbing guards against impact!



## International Construction Equipment

International Harvester Co., 180 North Michigan Avenue

**A COMPLETE POWER PACKAGE:** Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



# HOW TO GET MORE THAN TWICE THE LIFE FROM YOUR TIRES

RIISING COSTS in nearly every phase of fleet operation make it increasingly difficult to show a profit. Anything that will reduce down time, or cut operating costs-per-mile demands your serious consideration.

You owe it to yourself, therefore, to get all the facts on a *different, decidedly better cord* that adds thousands of miles to the life of truck tires. It's called Bekaert Steel Wire Cord.

Actual records from millions of miles of use under most severe conditions prove this high tensile carbon steel wire cord gives truck tires *more than twice the life of tires made with textile cord*. In many cases, tires have gone as much as 300,000 miles on original treads!

Moreover, since the steel cord retains excellent flexibility under vulcanization, tires with this new, better construction feature may be retreaded again and again.

## BANISH COSTLY ROAD DELAYS

The toughness of steel, which makes possible such remarkable wearing quality, at the same time provides *maximum protection against road delays caused by heat failures, impact breaks and punctures*. Using truck tires made with Bekaert Steel Wire Cord, you can gain significant reductions, both in operating cost-per-mile and in profit-wrecking down time.

## NEW FREE BOOK TELLS HOW

Bekaert has prepared an interesting, informative booklet, "*Extra Miles*," with all the facts about Steel Wire Cord and the dramatic role it plays in the evolution from cotton to rayon, nylon and steel wire in the continuing search for better cord.

This new, free booklet is yours for the asking. It explains why tires made with Bekaert Steel Wire Cord are virtually indestructible, yet sacrifice none of the resiliency of textile cord. It describes constructions which enable leading truck tire manufacturers to offer unparalleled protection against blowouts, cutting and curb damage. It shows how Bekaert Steel Wire Cord lets tires run up to 125 degrees cooler... tells how you get better traction, higher load carrying capacity and less power loss with tires made with Bekaert Steel Wire Cord.

Write now for your copy of "*Extra Miles*" and learn how you can get all the superior characteristics in the tires you specify from leading tire manufacturers, and start enjoying lower costs per mile without down time.

### SEND TODAY

**Bekaert Steel Wire Corporation**

655 MADISON AVENUE • NEW YORK 21, N. Y.

Please send me free booklet "*Extra Miles*"

Name

Company

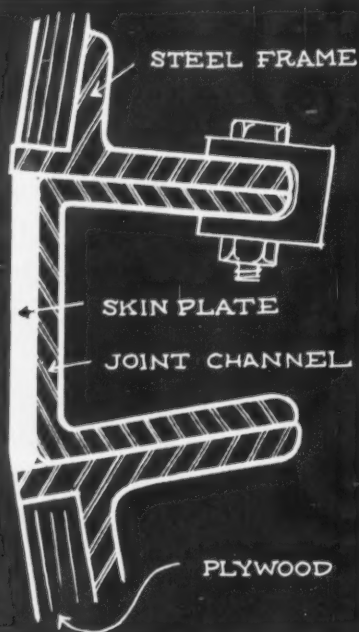
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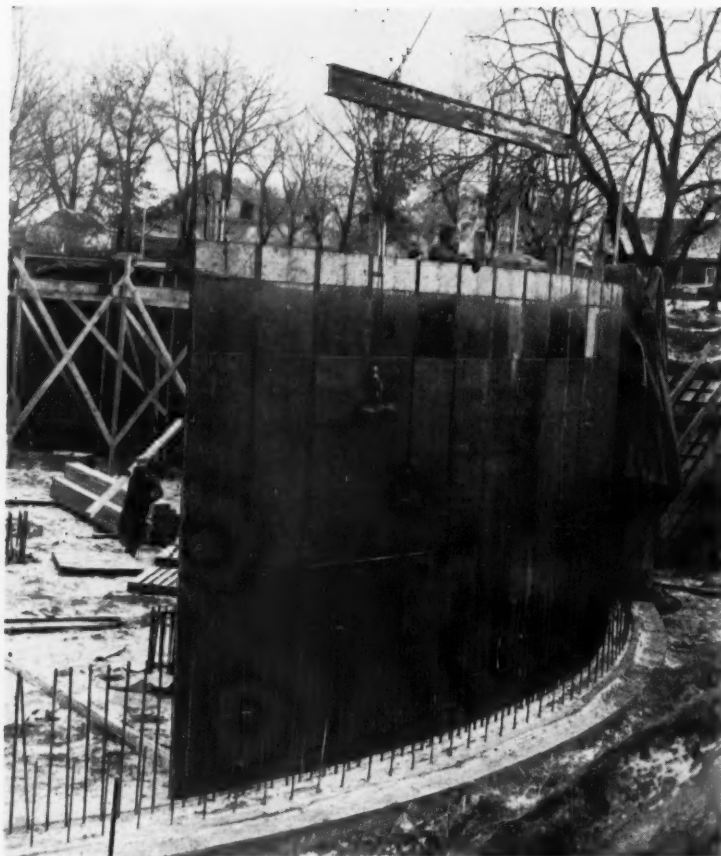
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BEKAERT STEEL CORD, Zwevegem, Belgium... Among Europe's Foremost Steel Wire Producers Since 1880





**CURVED JOINTS**—A channel between form panels bends slightly to give the gang form its curvature. Thin plate in back of channel insures smooth finish.



## Prefab Forms Make Round Wall

*To build three circular tanks, the contractor bolted together standard form panels into 330-sq-ft curved assemblies and handled them as a unit.*

**CURVED GANG FORMS** made up of standard steel-ribbed concrete form panels enable a contractor to form the walls for three 91-ft-OD circular tanks in a minimum of time.

Wilson & Tavriles, Inc., are building the tanks in Austin, Minn. They are part of a sewage treatment plant in that city.

Forming the inside and outside of the curved 18-in.-thick walls would have required handling and positioning many in-

dividual form panels. To avoid this, the contractor bolted together sets of 40 panels to make 20x15-ft curved gang forms. This enables one crane operator to handle 330 sq ft of formwork at one time.

The prefab gang sections are made up of Universal Form Clamp 2-ft-wide Uni-Form panels. Six gang sections make up the forms for the inside of the wall and six for the outside. Each section consists of two tiers of 2x6-ft Uni-Forms, one tier of 2x2-ft panels, and one tier of 1x2-ft forms.

### Vertical Joints

A 2-in.-wide, light gage, wide flange, metal channel forms the vertical joints between adjacent form panels. The form edges are bolted to the flanges of the channel. The channels also serve as braces for form ties.

The corners of the channel are formed by small fillets that form grooves in the forms and would leave vertical ridges in the concrete. To get a smooth surface, a thin strip of plate is added to the back of each channel. The width of this skin plate is equal to the gap between adjacent form panels. The surface of the skin plate is lined up with the surface of the form panels insuring a smooth finish to the concrete.

To get the right curvature, the gang sections are bent at the channel joints. In addition to the channels, a 2-in. metal filler with skin plate is inserted at every second joint on the outside forms. This is necessary to align the panels and joints of the inside and outside forms.

Inside forms are built on a 44-ft radius at the face of the form. Outside forms have a 45½-ft radius. The prefab forms do not





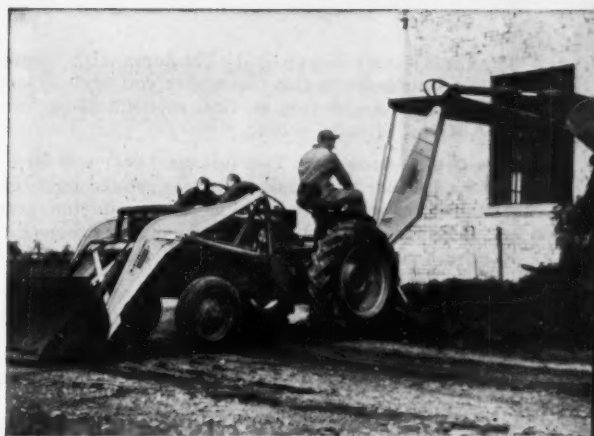
## **New!** **a low-cost Diesel** **in the 35 hp class!**

**For the first time**, get Diesel fuel savings plus traditional IH strength and stamina *in a low-cost, 35 hp tractor!* . . . the new International B-275 Diesel.

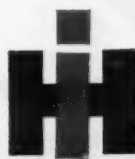
**This outstanding 4-cylinder Diesel is an** amazing cost-cutter . . . get fuel-cost savings of up to 50% for every day in operation. Count on IH dependability to give you more trouble-free operating time than you have ever known. The rugged B-275 has up to 300 pounds greater built-in weight than tractors common to this power class.

**Operators breeze through toughest jobs** with effortless ease. Eight speeds forward from 1½ to over 14 mph provide the right speed to match each assignment. *Differential lock* ties rear wheels together, keeps the B-275 on the go where others spin out.

**A full line of matching equipment** lets you cut your costs on any job with a full-featured International B-275 Diesel! See your IH Dealer . . . he will be glad to demonstrate!

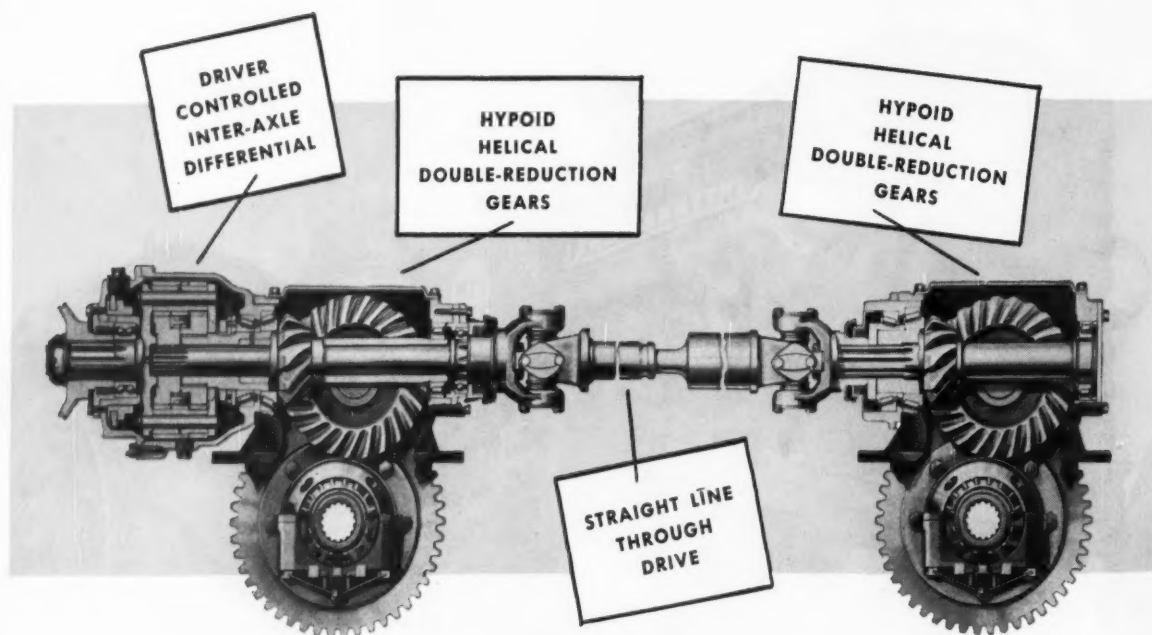


**Team the compact rugged B-275** with International Wagner 10-foot backhoe and front loader with 1,600-pound lift. Handle the widest range of three-point tools and equipment with the B-275's double-duty three-point hitch.



**INTERNATIONAL  
HARVESTER**

International Harvester Products pay for themselves in use—Farm Tractors and Equipment . . . Twine . . . Industrial Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois.



## Hypoid Double-Reduction Gears Make TIMKEN-DETROIT® HEAVY-DUTY TANDEMS

*first in performance, long life and low maintenance cost!*

Timken-Detroit Heavy-Duty Tandems with Hypoid Helical Double-Reduction Gears give you payload leadership, long trouble-free service, economical performance. Here's why —

**True Double-Reduction.** Two full sized gear sets form a balanced power train with each gear set accomplishing a healthy reduction. Husky hypoid first reduction gears and wide faced helical second reduction gears combine to form a rugged double-reduction drive that will outperform all others.

**Widest Choice of Axle Ratios.** Timken-Detroit "balanced design" full double-reduction does not limit the secondary gear set to a fixed low numerical value which depends on primary gear set for all ratio changes. The

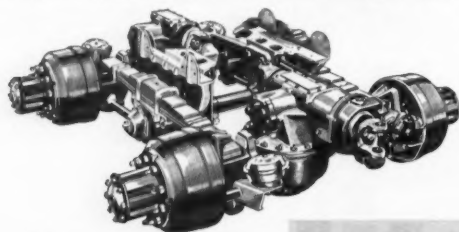
hypoid-helical gear arrangement permits a wider range of ratios because the numerical value of both the primary and secondary ratio gear sets can be varied.

**Top-Mounted Straight Line Drive.** Eliminates all prop shaft angularity. Bearing and gear life is increased. Maintenance costs reduced. Top-mounted position of carriers provides main drive shaft alignment — ideally suited for short wheel base trucks or tractors.

**Driver Controlled Inter-Axle Differential.** Divides torque equally between axles, yet compensates for any differential of speed between the axles. Both axles are always doing equal amounts of work . . . can be locked out at any speed when poor traction conditions exist.

**Tough, Torsion Flow Axle Shafts Are Best By Any Test.** Don't be misled . . . patented Torsion Flow Axle Shafts are still the best available to the American Trucking Industry. Comparison tests prove that Timken-Detroit Axle Shafts, spline diameter for spline diameter, are the toughest ever made.

World's largest manufacturer of axles  
for trucks, buses and trailers



*Another Product of...*

**ROCKWELL-STANDARD**  
CORPORATION



Transmission and Axle Division, Detroit 32, Michigan

## PREFAB FORMS . . . continued

deviate more than 1/8 in. from a true circular arc at any point along the wall.

### Laminated Walls

Waling for the curved gang forms is somewhat unusual too. Instead of using solid pieces of lumber, the contractor laminated four thicknesses of 3/4-in. plywood to make up the wales. The plywood sections are 8 ft long and 7 5/8 in. wide. Individual thicknesses of plywood were easier to cut to a large radius than solid wood.

Wales are located at four different heights around both the inside and the outside forms. Inside wales have a radius of 43 ft 9 1/2 in.; outside wales are cut to a radius of 45 ft 8 1/2 in. Universal Snap-Tie Liners secure the wales to the forms.

Form ties, 16 in. long and 1/2 in. in dia, are inserted through holes in the joint channels and secured with two Universal Spiroloc Cone Nuts. Two 5-in. stud rods also are passed through the channel rod holes and screwed

onto the cone nuts for spreading the forms to the proper wall thickness.

A jig is cut to the 1 1/2-ft wall thickness and placed between the gang forms; the cone nuts are snugged against the forms. Two nut washers are screwed into the stud rods and tightened against the exterior of the forms.

When the jig is removed, the spreading action of the cone nuts holds the wall forms 1 1/2 ft apart. All cone nuts are oiled thoroughly for easy removing from the concrete during stripping.

Wilson & Tavrides built each tank in eight pours—four pours filled the lower 14 ft of the tank wall, and four more pours were necessary to complete the upper 15 ft. The contractor used the same prefab gang forms for both upper and lower pours.

A haunch around the top of the lower pour slopes out at 30 deg to increase the wall thickness to 2 ft. This presented no forming problem except that an additional 2-in.-wide metal filler with skin plate was necessary at every

fourth panel joint to align the inside and outside form panels and joints.

### Form Stripping

To strip the forms, crews remove the nut washers, stud rods, and cone nuts and separate each 20x15-ft gang form from the adjacent sections. Then a crane picks up each form assembly in one piece. Forms for the lower pour are stripped parallel to the 30-deg haunch angle.

Special pick up brackets were designed and fabricated by Universal to enable a crane to handle the form assemblies. The pick up brackets are slipped under the top edge of the forms at four points along gang sections and secured to the forms with drift pins. Cables from the two pairs of lifting brackets run to two points on an I-beam that is suspended from the crane's hoist line. With this lifting arrangement a crane is able to pick up and move an entire 2,500-lb gang form assembly in one operation.



When you face your  
jobsite with a shovel in one  
hand and a life preserver  
in the other, it's time to  
call STANG. We'll dewater  
your excavation quickly,  
efficiently and economically.

**John W. STANG Corporation**  
**Los Angeles • Omaha**  
**Tulsa • St. Petersburg**

60-5



A high-contrast, black and white aerial photograph of the Shasta Dam. The dam's massive concrete structure curves across the upper half of the frame, with its spillways visible. Below the dam, a large reservoir is visible, with a winding road or path along its edge. The surrounding landscape is rugged and mountainous. The text "Serving the Construction Industry..." is printed in a serif font in the upper right corner.

*Serving the Construction Industry...*

**Above:** This dramatic view of Shasta Dam in California demonstrates the progress made by construction engineers in conserving water supply, preventing flood destruction and to provide water needed to make arid or drought-stricken land useful again.



# SYMONS® CONE CRUSHERS

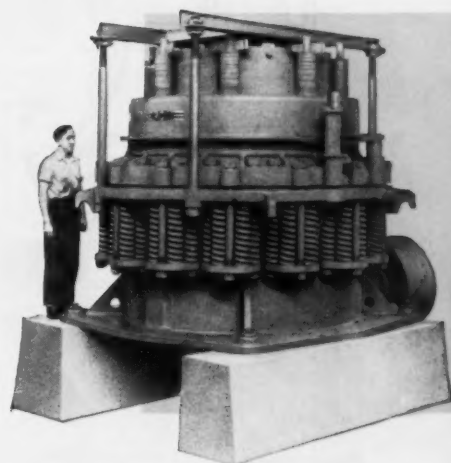
**produce big tonnages of quality  
construction materials at low cost per ton**

Illustrated here are typical examples of the vast contributions to the progress of mankind being made by the construction industry. Technological advancement in civil engineering of huge construction projects such as these call for rigid specification aggregates, crushed sand and cement. To meet the constantly growing demand for vast tonnages of these quality construction materials, Symons Cone Crushers have long been the first choice of leading producers throughout the world.

For in the production of construction materials . . . as in all of the great ore and industrial mineral operations the world over . . . there has been no record to equal the performance of Symons Cone Crushers that have so consistently and efficiently produced great quantities of finely crushed product at low cost.

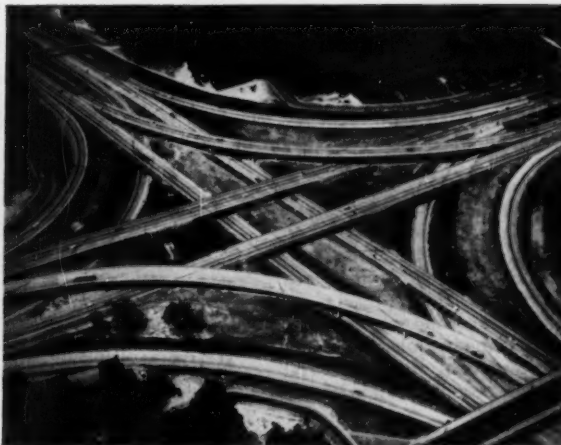
Whether you are a contractor, operator, construction engineer, designer or manufacturer, it will pay you to specify and use Symons Cone Crushers . . . as well as the other Nordberg Machinery for the construction industry . . . all designed and built to deliver maximum output at lowest possible cost. Write for literature.

*SYMONS . . . a registered Nordberg trademark known throughout the world*



## SYMONS CONE CRUSHERS

*... the machines that revolutionized crushing practice... are built in Standard, Short Head, and intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to over 900 tons per hour.*



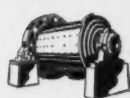
**Far left:** To meet the challenge of the jet age, engineers and contractors are being called upon to build and expand airport runways to handle the ever-increasing traffic. (View shows Lambert Field, St. Louis).

**Left:** This view of one of the interchanges on the high speed Detroit expressway is a striking example of the contribution the construction industry is making to the tremendous highway expansion program.

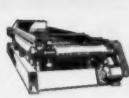
©1950, N. M. CO.



SYMONS PRIMARY  
GYRATORY CRUSHERS



NORDBERG  
GRINDING MILLS



SYMONS  
VIBRATING SCREENS



SYMONS  
VIBRATING GRIZZLIES



ROTARY KILNS  
and COOLERS



NORDBERG ENGINES

**NORDBERG MFG. CO.**  
Milwaukee 1, Wisconsin

**NORDBERG**



ATLANTA CLEVELAND DALLAS DULUTH HOUSTON KANSAS CITY MINNEAPOLIS NEW ORLEANS NEW YORK ST. LOUIS  
SAN FRANCISCO TAMPA WASHINGTON TORONTO VANCOUVER JOHANNESBURG LONDON MEXICO, D. F.



## KOHLER ENGINES

### Reliable power for construction equipment

The name KOHLER, recognized and respected the world over as a mark of value, is your assurance of undivided responsibility and top performance.

Kohler engines are rugged, quick-starting in all weather, conservatively rated. Short stroke design gives maximum usable power, cuts engine friction.

Sold and serviced through a nation-wide organization, Kohler engines are increasingly being installed on a wide variety of construction, agricultural and industrial equipment. They power Kohler electric plants, known everywhere for reliability.

Kohler Co. has manufactured internal combustion engines for 40 years.

FROM 4 TO 24 H.P. Write for illustrated booklet.

KOHLER Co. Established 1873 KOHLER, WIS.

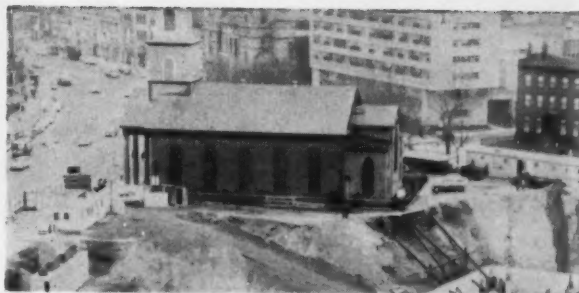


**MODEL  
K161**

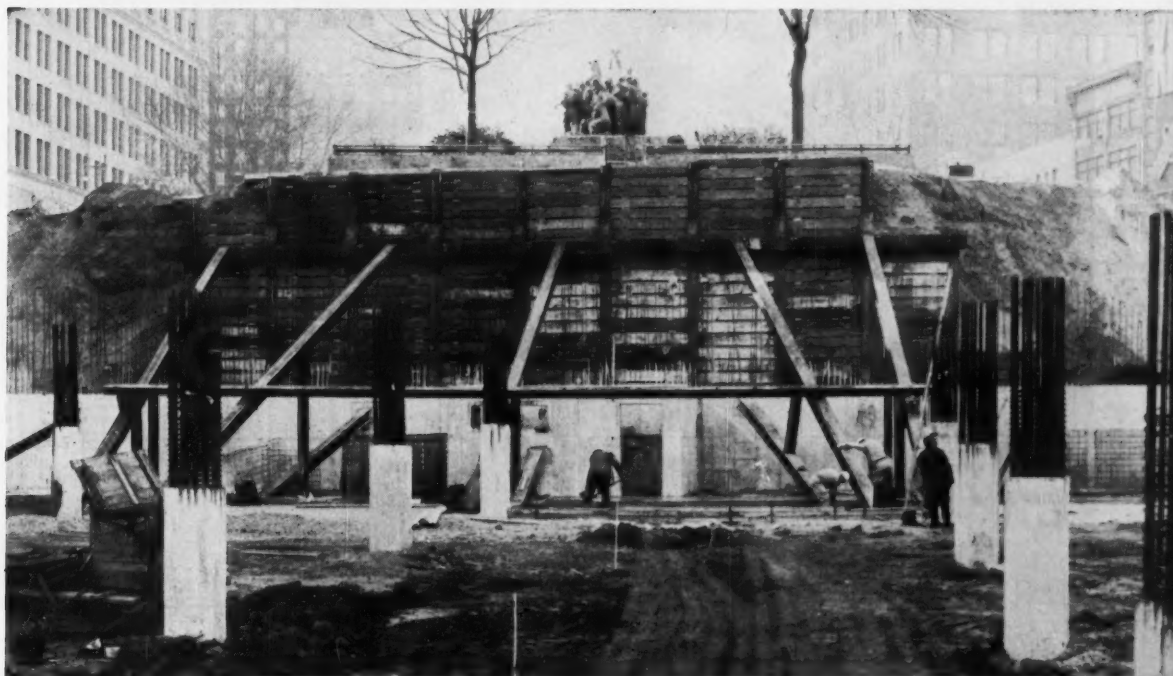
**4-cycle  
Short stroke  
Air-cooled**

## KOHLER OF KOHLER

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS • ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS



**PROTECTIVE SHEETING**—Soldier beams and timber sheeting protect historic sycamore tree (left) and 200-year-old church (right).



**WAR MEMORIAL**—Two tiers of braces reinforce soldier beams and timber protective wall at deeper cut beside war memorial.

After the garage is complete, earth will be filled in on top of it and the park will resume its original appearance and function.

## Bracing Wall Acts as Formwork

By Albert Di Giacinto  
Vice President  
Spencer, White & Prentis, Inc.

*To build a garage under a park, we designed a bracing system that preserved local monuments and doubled as a form support for the garage wall.*

**BUILDING** a three-level garage under a city park without changing the appearance or function of the park can involve a contractor in some unusual foundation and bracing problems.

Spencer, White & Prentis, Inc., of New York solved an assortment of such problems while they were installing the temporary sheeting and bracing system for a 1,030-car concrete garage under Military Park in Newark, N. J.

On one side of the site we designed a bracing system that

supported a trench for a relocated sewer pipe and also carried the forms for the main wall of the garage. To protect a 200-yr old church on the site, we carefully drove soldier beams for a bracing wall beside it.

On the south side of the site, a bronze monument to the Wars of America and a sycamore tree under which George Washington reviewed Newark troops during the revolutionary war had to be maintained unharmed because of their historical value.

*continued on page 133*





**NYGEN-  
BUILT**

# GENERAL TIRES

***keep driving longer  
for lowest cost-per-mile***

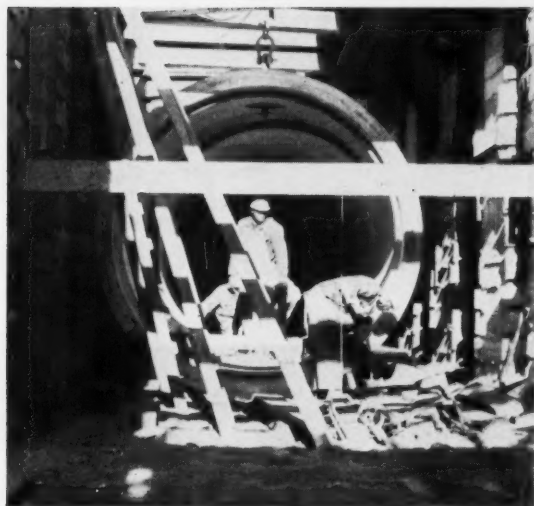
It takes just one "down" unit to wreck schedules, eat up narrow profit margins. That's why more and more contractors count on the Nygen-built General Tire to keep units rolling whatever the going. Engineered for maximum traction and minimum rolling resistance, Generals take mud, sand, rock and grades in stride . . . help hold costs down to keep profits up. Prove it to yourself on your next big job.



**THE GENERAL TIRE & RUBBER CO. Akron, O.**



## Tie-Back Angles On Double Wall Replace Walers



**TIE-BACKS**—Diagonal angles transfer load from otherwise unsupported soldier beams to outside wall, then through struts to braces on inside wall.

**LAYING PIPE**—Crews lay the 9-ft dia sewer pipe sections inside the double wall bracing system. Second row of tie-backs will go in above pipe.

The Newark Parkway Authority is building the garage. The top of the finished structure will be well below the ground level of the park so as not to interfere with landscaping. Except for inconspicuous vents and access facilities, the garage will not change the appearance of the park. Terminal Construction Corp. of Wood Ridge, N. J., is general contractor.

The floor plan of the garage, measuring 300x525 ft in its largest dimensions, was tailored to fit the shape of the park and available space under it. A 9-ft dia sewer that crosses the park was relocated around one side. But all other structures and services were maintained in their existing locations by a bracing and underpinning system designed for this job.

### Bracing System

Ground under the park consists mostly of dry sand and gravel, with a little water at the subgrade level. Spencer, White & Prentis supported the earth banks around the main excavation with a system of soldier beams, horizontal wood sheeting,



**NO WALERS**—Tie-back system eliminates walers, leaves every second soldier beam free of braces. Wall acts as concrete forms.

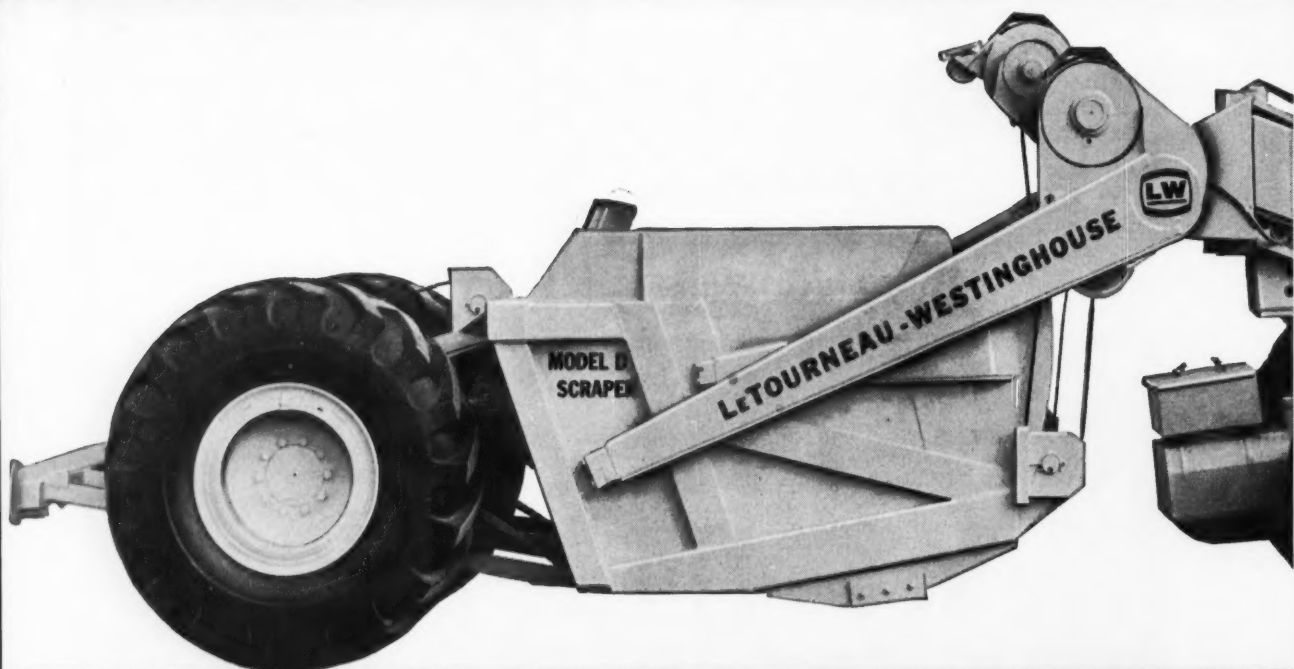
and inclined steel braces bearing against the concrete spread footings of the new structure.

On the west side of the excavation, the design required three tiers of braces to support a 38-ft bank of earth. The soldier beams were 12BP53 sections driven to

a penetration of 6 ft below subgrade. Spacing was 7 to 7½ ft.

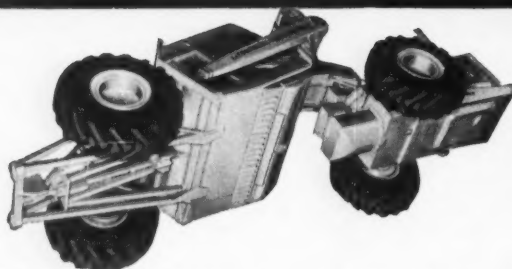
Welded to the soldier beams were 14BP89 steel walers. Substantial steel brackets were installed above the walers to prevent rotation.

*continued on page 138*



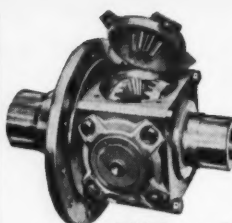
Owner of  
40 "D's"  
says:

**"As a cleanup tool, the D 'Pull"**



#### Flat blade and bottom for fast finishing

D 'Pull's flat, straight-edged blade and smooth, flat bowl-bottom let you establish grades that are remarkably close and accurate. Some scrapers in this range offer curved or rounded blades and bottoms which make them completely unsuitable for finish-work.

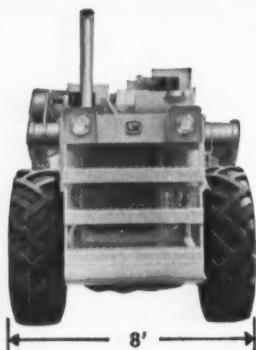


#### Power-Transfer Differential licks traction problems

When either "D" drive-wheel starts to spin in soft going (or on curves, slopes) its tractive effort is immediately and automatically transferred to other drive wheel. You get "keep-moving" traction in conditions that stop other scrapers. Famous LW differential is simple, maintenance-free.

#### 2800 sq inches of brake surface

That's 2½ to 7 times more brake surface than any other scraper in "D's" class. You get heavy-duty air brakes on each wheel, with alternately-placed lined and moly-coated steel discs.



**Roadable  
without  
permit**

Only D 'Pull, in its size class, meets requirements for permit-free roadability. It is only 8' wide, has less than 9 tons of weight on either of its axles. You can route it along city streets without flat-bed and loading crew. And on finishing jobs, it can return along concrete highways not yet open to traffic, with no fear of cracking or chipping the new surface.

#### Best power-weight ratio in its class ... for more "snap", higher speeds

Each of D 'Pull's 143 "horses" has to power only 299 lb of loaded weight. Here's how this compares in the industry:

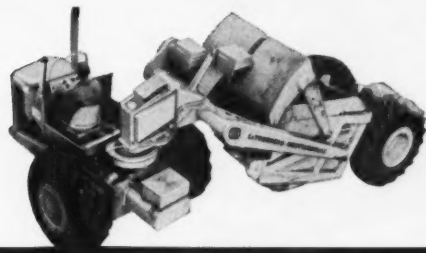
Scraper	Lb Weight Unit & Load	Rated hp	Power-Weight Ratio
D 'Pull	42,830	143	299:1
A	52,500	155	339:1
C	58,500	143	409:1
E	47,500	148	321:1
I	81,500	172	474:1
M	54,000	162	333:1



**has no competition"**

**Most maneuverable scraper of all**

D 'Pull U-turns in 24'3"-wide area. No other scraper can touch that maneuverability. You benefit on every cycle, because "D" can work closer to edges of new highway slabs, position faster, get into fill more easily, and avoid long, slow back-ups.



**Plus all of these Cost-Cutting  
"Best of Its Class" Advantages**

CHOICE OF TRANSMISSIONS...step-gear or power-shift with torque-converter (only scraper in this range to offer you this choice); LOWEST LIST PRICE...HIGHEST TRADE-IN VALUE...ELECTRIC CONTROLS for fast response, easiest operation, lowest maintenance costs, and complete weather-proof availability...INTERCHANGEABLE TRAIL UNITS: remove scraper and use 11-ton Rear-Dump, Flat-Bed, Side-Dump, or Crane behind D 'Pull prime-mover.

**Here's a direct quote  
from a contractor† who's one of  
the country's ten largest**

"Cleanup work is a 'necessary evil' on construction jobs. Even though it isn't the 'money-making' portion of the job — if it can be accomplished quickly and economically, it's still money in your pocket.

"As a cleanup tool, the LeTourneau-Westinghouse D Tournapull® has no competition in its class. Because of its size, it is economical to operate; it is highly maneuverable; it can be roaded from job to job over highways, or from section to section of jobs easily and fast; and where operating areas are restricted, its short turning radius makes it possible to handle cleanup jobs where other equipment cannot."

†Name on request.



Your LW Distributor has copies for you and your equipment supervisors of this new 16-page summary of D Tournapull features. It gives you the background facts of why the "D" is a money-maker on any-size job. Better yet, talk to your LW Distrib-

utor about a demonstration of the D 'Pull as a finish and cleanup tool, on any job you're now handling. He'll arrange all details at no cost or trouble to you.

\*Trademark DP-2298-DC-2



**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

*A Subsidiary of Westinghouse Air Brake Company*

**Where quality is a habit**



## **Question:**

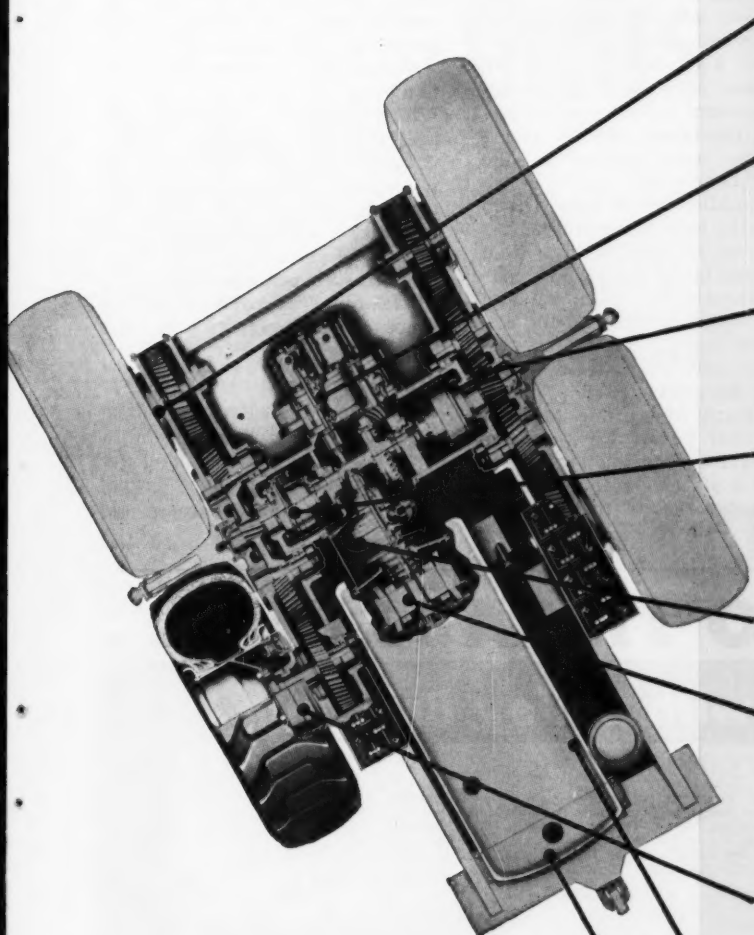
**What makes this big tractor work faster  
...do more work at less cost?**





# Answer:

## Fast travel...efficient transfer of power through anti-friction power-train



**C**ompact, sturdy construction...fast maneuverability...easy handling...and quick acceleration, combine to give you a heavy-duty tractor adaptable to wide usage. The entire LeTourneau-Westinghouse Tournatractor® mechanism is protected from abrasive dirt and corrosive moisture. Machine rolls freely...on top of the dirt...on big, self-cleaning tires that give low-cost, high-speed operation. On every tractor job Tournatractor will help you cut costs. We will be glad to demonstrate.

### Sturdy axles ride on anti-friction bearings

Heavy axle housings are welded to case for rigid support. Axles ride on roller and ball bearings with smooth, anti-friction ease. Axles are heavy and accurately balanced to take severe shocks and give lasting service.

### Constant-mesh transmission

Standard on all Tournatractors. A long-proven, air-operated unit giving reliable performance on thousands of Tournatractors, as well as on LW Tournapulls®, in world-wide service. Transmission is operated by an air-clutch assembly, installed as a single unit.

### All gears made of special alloys for anti-friction wear

Materials used in all gears are specially selected for strength, and heat-treated to survive severe shocks and wear. Close fit and smooth operation minimizes heat and power-loss, assures longer life, fewer maintenance problems and costs.

### Independent steering clutch

Machine makes complete reverse turn in 6 seconds and a non-stop U-turn within a clearance of 20'. That's because of independent steering clutch, instant gear selection, and large brake surface. Machine maneuvers easily in tight quarters at greater speed and less operator effort.

### Single-stage torque converter 4 speed ranges forward, 2 reverse

Exclusive LW design. Built specially for trouble-free operation, proved in thousands of installations all over the world.

### Heavy-duty electric generator

Crank-shaft-driven, direct from engine. Electric control in Tournatractor has proved more economical to maintain than hydraulic or cable-control systems. Simplicity of electric control keeps maintenance costs low, makes handling fast, easy. Also provides portable power supply for emergency use of searchlights, welders, drills, other electric equipment.

### Heavy-duty air brakes (3,762 sq in. brake surface)

Operator has sure, safe control at all times with moly-coated brake discs. He has more square inches of braking surface per wheel (940½") than most comparable units have on the whole machine. This gives operator confidence to work close to steep embankments, down steep grades.

### Choice of GM or Cummins diesel engine

Permits selection of power desired. GM 6-71 delivers 218 hp at 2000 RPM. Cummins HBIS-600 delivers 210 hp at 1800 RPM. Plenty of power with the engine of your choice, to get the snap and lugging action required for best tractor performance.

### Independent cooling for torque-converter oil

Torque-converter oil is circulated through separate heat exchangers located in base of machine radiator. Oil is kept at cool operating temperature for maximum efficiency of torque converter.

CT-2292-DC-2



**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

*A Subsidiary of Westinghouse Air Brake Company*

**Where quality is a habit**

## BRACING WALLS... continued

The inclined braces were 12BP53 sections, welded to the walers about every 15 ft. The walers were reinforced at the point of contact by stiffeners. All braces were set at an angle of 30 deg or less from the horizontal.

Where possible, the braces were set against the concrete footings for the new structure. To provide sufficient capacity for the horizontal loads imposed by the braces, many of the footings were braced by struts extending back to other footings. To hold a brace within the design 30-deg slope, it often was necessary to terminate its lower end against a stub beam embedded in the concrete footing. Where footings were not available, temporary timber mats distributed the load into the ground.

In all cases, the lower end of each brace was equipped with a set of steel plates and three sets of 1/2x3x14-in. forged steel wedges to prestress the member when it was installed. From time to time as the job progressed,

the wedges were re-driven to keep the system tight.

The braces were reinforced in two directions to reduce the span required and to permit the use of lighter sections for the braces.

Vertical 8BP36 posts restrained the braces in the vertical plane. The posts were driven about 10 ft below subgrade to resist uplift because a brace, if overloaded, will bend up as well as down.

To prevent failure due to horizontal movement, 8BP36 lacing members were welded to the soldier beams and braces.

The soldier beams were driven before the excavation started. As earth was removed, crews fitted in treated horizontal wood sheeting consisting of 3-in. random width rough lumber. As the excavation reached the proper elevations, the steel walers and braces were added.

Generally the inside faces of the soldier beams were set 3 1/2 ft from the specified surface of the wall of the garage to allow for construction of the forms.

The specifications called for the braces to be embedded in the concrete wall and cut off on the inside after the building is complete. Except for cutting off the soldier beams below final site grade to permit proper landscaping of the park, no parts of the bracing system outside the garage will be removed.

The sheeting and bracing system was designed by Spencer, White & Prentiss using Terzaghi's theory of soil pressures and distribution. The load for the 38-ft section was computed to be 13.8 tons per running foot. This load included a surcharge of 3 ft.

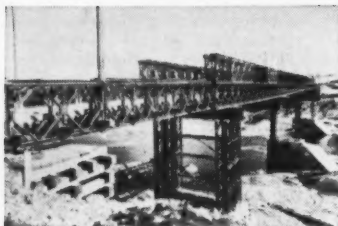
At the monument and sycamore tree the earth bank was only 33 ft high, and two tiers of braces were enough to carry the load.

### Trench Bracing

The most difficult part of the sheeting and bracing system to design was the section along the 500-ft east wall of the garage.

*continued on page 140*

# YOU CAN DO IT FASTER... with Bailey Bridging...



For emergency, access, permanent or suspension type bridging. These versatile units also used for buildings, forms, trestles, falsework. Bridge shown here is over Smooth Rock Falls, Ontario, Canada, one of five Baileys used by Ontario Department of Highways in this area.

## ... and Uniflote Ferries ...



Combined floating Uniflote sections provide transport across water for loads up to 100 tons! Other uses: floating platforms for derricks, cranes, piledrivers. Landing stages, wharves, piers, etc. Uniflote Ferry in photograph carried 30-ton equipment load across Harbour in Toronto, Canada.



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# GALION® Vibratory Compaction...

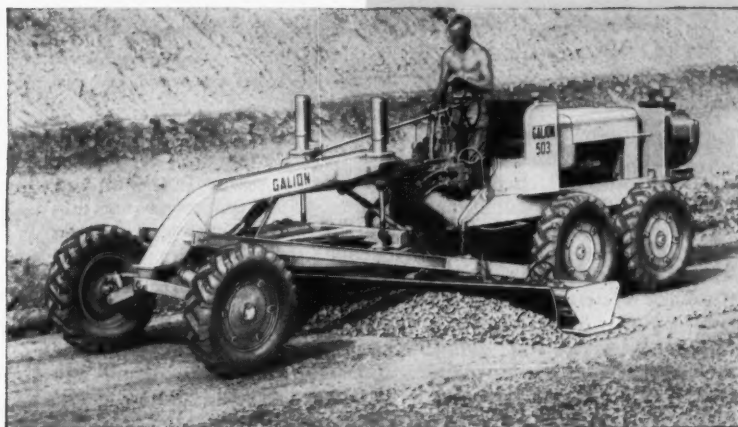
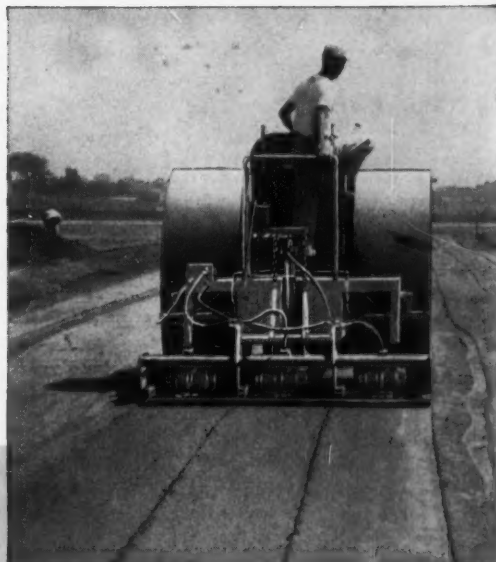
With the GALION 3-WHEEL ROLLER VIBRATORY COMPACTOR combination, you not only attain specified densities of granular materials, but you also can achieve effective compaction of the many soils which respond best to a static weight roller. In addition, the 3-Wheel Roller can be used for the compaction of finish surface materials. This multi-purpose usage multiplies the profit possibilities on your roller investment.

With the GALION Model 503 GRADER-VIBRATORY COMPACTOR combination it is possible to spread, level, and compact the material—all in ONE operation or separately as the situation may demand. The vibrating unit is raised hydraulically for speedy travel on, to and from the job. The profit possibilities of this combination are not limited to one function. Vibrating Compactor unit is easily removed to permit other grader operations such as ditching, blading, windrowing, etc.

With the GALION Grader or Roller and Vibratory Compactor combination you SAVE—on equipment cost, labor costs, operating costs and overhead costs.

## UNITS

doubly  
useful -  
doubly  
profitable



### ELECTRIC VIBRATORY COMPACTOR FEATURES

- Delivers up to 4200 three-ton, deep-penetrating compacting blows per minute.
- Vibratory Compactor can be operated with Roller or Grader traveling forward or reverse.
- Compacted surface is smooth and flat—no waves or "washboard" effect.
- Roller and Grader are protected against vibration of the compactors which FLOAT on the surface.
- Power unit (engine and generator) for compactor can be used as an emergency lighting plant or for the operation of small power tools.
- Individual compactor shoes can be detached and fitted with operating handle for compacting confined spots others can't reach.

### THE GALION IRON WORKS & MFG. CO.

General and Export Offices

Galion, Ohio, U.S.A.

Cable Address—GALIONIRON, Galion, Ohio



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**VIBRATORY COMPACTORS • PNEUMATIC TIRE ROLLERS**

THE GALION IRON WORKS & MFG. CO.

Date \_\_\_\_\_

Dept. CM-40, Galion, Ohio

Please send me complete information on ☐ 3-Wheel Roller with Vibrator ☐ Model 503 Grader with Vibrator

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm or Dept. \_\_\_\_\_

Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_



## BRACING WALL...continued

There were two parallel rows of sheeting in this section designed to serve three functions.

First, the outside row of sheeting supported one side of a trench for the relocated 9-ft sewer line. Second, when the sewer was installed, the inside row of sheeting supported the sewer and the adjacent street while the main excavation was carried to the subgrade depth of 35 ft. Third, the inside sheeting, supported by a tieback system that eliminated the need for walers, acted as the back form for the garage wall.

The soldier beams for the street side of the sewer trench were 14BP73 sections. They were driven on 9-ft 8-in. centers from the street surface before excavation began.

The trench was excavated to a depth of 8 ft, and 4-in. horizontal wood sheeting was placed between the soldier beam flanges. Then the inside row of 12BP53 soldier beams was driven, and the sewer trench excavation was carried to subgrade.

On the garage side, the 4-in. sheeting was placed tight against the flange of the soldier beams facing the garage so it could be used later as a back form. It was held there by wedging blocks against the opposite flanges of the soldier beams.

### Tie-Back System

The double row of sheeting and soldier beams allowed Spencer, White & Prentis to install a tie-back system between the walls to eliminate walers on the inside of the garage excavation.

We installed braces on every second soldier beam of the inside wall of sheeting. From the backs of the remaining soldier beams, we welded 4x4½-in. angles diagonally to the adjacent soldier beams on the street side of the sewer line. The load was transferred from these beams through horizontal 10x10-in. timber struts to soldier beams on the inside that were supported by braces.

The tie-back angles were installed at two levels, one about 9 ft below street level, the other about 17 ft below that. The sewer



**DEEP CUT**—On one side of excavation, a 38-ft cut requires triple row of braces. Exposed parts of braces are cut after wall is poured, but most of the bracing remains in place.

er pipe went in between them.

In the actual building sequence, the sewer trench was excavated to below its subgrade and a lower tie-back system was installed. The pipe was laid and the trench backfilled. Then the top tie-back system was put in place.

While this work was going on in the pipe trench, the main excavation was carried down to subgrade, leaving a large berm of earth against the sewer trench walls. The permanent concrete footings were also poured at this time.

Then the top row of 14WF73 braces were installed and wedged against the footings. The berm was excavated to an elevation that allowed the second row of 12BP53 braces to be put in. Then the excavation and sheeting continued to subgrade. There were only two rows of braces on this wall.

A large underground Public

Service Co. vault containing transformers passed along the route of the sewer. It was underpinned while the sewer was installed. Beyond the end of the garage, the sewer was built in a conventional sewer trench.

A Marion 32 steam crane and a Manitowoc 2000B diesel crane equipped with fixed leads and a No. 1 Vulcan single acting pile hammer drove the soldier beams. Energy to operate the hammer came from a 600-cfm Ingersoll-Rand rotary compressor. A 25-ton Northwest truck crane serviced the pile drivers and installed the bracing system.

### Men on the Job

Mickey Kenny was superintendent for Spencer, White & Prentis. For Terminal, John Allen is superintendent, and Frank Holmis is engineer. Stephan Petro, Jr., is executive secretary of the Newark Parkway Authority.





*On Giant Jobs Requiring Extra Care in Forming . . .*


## Contractors Use Symons Steel-Ply Forms

Symons Steel-Ply Forms have earned their excellent reputation by serving with speed and efficiency on a wide variety of large forming jobs . . . missile bases, airports, sewage treatment plants, expressways, bridges, filtration plants, schools, hospitals, shopping centers, culverts and reservoirs.

All of these jobs were handled by large contractors. Many are listed among the top 100 contractors in the country. Symons is privileged to have many of these contractors as customers. Some of them are . . . George A. Fuller, Turner Construction, Hilp & Rhodes, Gust K. Newburg, S. N. Neilsen, Sumner Sollitt, Terminal Construction, F. H. McGraw,

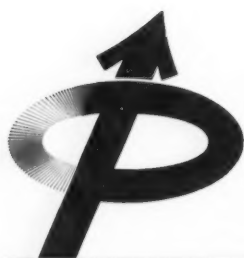
Pomeroy, Standard Construction Co., Fruin-Colnon, Perini Corporation, Southeastern Construction Co., Peter Kiewit and Long Construction Co.

Contractors who use Symons Steel-Ply Forms can bid on almost any type concrete job. Symons Steel-Ply Forms can be rented with purchase option. Steel-Ply Form catalog sent *free* upon request.

 **Symons CLAMP & MFG. CO.**

4249 Diversey Avenue Dept. IN Chicago 39, Illinois

*Warehouses Throughout the U.S.A.*



# THE PITMAN QUIDNUNC

Or, "what's new in the construction industry"...  
from Pitman Manufacturing Company, Grandview, Mo.



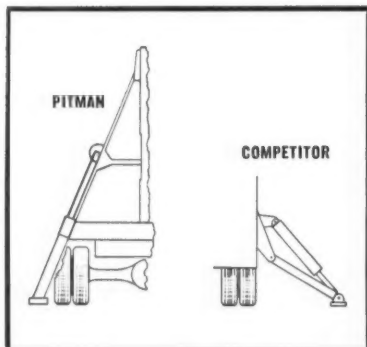
## UNDAMAGED PIPE PAYS COST OF HYDRA-LIFT IN A YEAR FOR THIS K. C. CONTRACTOR

Rolling 'em off a trailer meant lots of chipped and broken pipe for this Kansas City contractor. Then Universal Pipeline Constructors, Inc. tried a Model 60-HB Hydra-Lift, mounted on this 2½-ton truck. Now they string miles of pipe per day without spoiling a single length—the savings actually paid for their Hydra-Lift within a year!

We found this unit loading pipe, trucking it out, stringing and laying on a wide variety of jobs. Universal's trencher rides the platform, too, below the boom.

Operator Elmer Bennett likes the way that full-hydraulic boom goes to work while his truck stays on the road—he never needs to jockey in or block traffic. "I reach right over the spoilbank and trench," says Elmer, "or even over parked cars—and I lay twice as much pipe as I could before we got this outfit."

Fred Preston, General Manager, says "Our Hydra-Lift makes a profit on jobs we couldn't have touched before. We're through with home-made rigs." (And what could we add to that?)



### FIRM FOUNDATION ESSENTIAL

Pitman Outrigger is built like an "A"—with line-of-support straight from ground to boom pivot point. Cylinders are completely enclosed in telescoping box channels, which prevent damage to the hydraulic rods and cylinders.

Many outriggers simply flop down, to be held by exposed hydraulic cylinder. Any grit on rod wears out "O" seals. Any heavy object falling on cylinder causes serious damage, may collapse it.

## City keeps trees in trim with Pitman Aerial Platform

Shade trees give parts of Kansas City unique beauty—and it used to be a tough job to keep them trimmed. "Then we bought our first Pitman Aerial Platform," reports Herb Brackney, Landscape Architect. "Our men work safer and faster, now—and the trees look even better than before." This Pitman Model 40-HD reaches 40-foot working height. Lifts 1,000 lbs. using outriggers, 300 lbs. without. Boom rotates 360° in either direction, at same time the two-man basket goes aloft.



## "What on earth is a Quidnunc?"

Don't blame you for asking. As a matter of fact, we hoped you would. "Quidnunc" is the combination of two Latin words, "quid" and "nunc." Literally it means "what's new?" The answer is—there's *always* something new in the construction industry... and it's the function of "The Pitman Quidnunc" to keep you posted. For more dope on the versatile equipment you see here, drop us a line at 12754 Pitman Road, Grandview, Missouri.



**NEW!**

**Now, a loader and backhoe worthy  
of the Fordson Power Major Diesel**

We'll match the performance, price, productivity, fuel economy, ease of servicing and overall dependability of this new Fordson Power Major package against any similar tractor-loader-backhoe on today's industrial market.

Granted, there's little gamble in this challenge. Fordson diesels long ago won their vote of confidence from tractor users

all over the world. The new Ford 2500 lb. Super-Duty loader and Ford 14' backhoe are basically the same heavy duty units engineered for the Ford Industrial tractor — equipment which has been proved while handling some of the toughest industrial jobs to be found anywhere. Phone your Ford Tractor and Equipment Dealer for a demonstration!

*Ford Motor Company*





**NEW!**

## **Fordson's power, weight and economy teamed with Ford's top producing loader and digger**

The Fordson Power Major is the newest, most powerful version of the world's first mass-produced tractor . . . traces its origin back to the first Fordson of 1917. During those many years of improvements, Fordson has become a buyword for steady, dependable tractor power and unmatched fuel economy—a gallon an hour or less under full load, according to many owners. Now, for the first time, you can buy a tractor-matched, Fordson-size loader and backhoe. And what a production team it makes!

The loader has 2500 lbs. rated lift capacity, 5500 lbs. breakaway capacity, 22-degree bucket rollback, 3" below-grade digging and  $\frac{5}{8}$  to 1 cu. yd. tread width buckets. The same type rugged subframe and hydraulic system mounts and powers Ford 12' or 14' backhoes. The largest of these, shown above, is in a class by itself and has no competition except for big, specialized rigs. Why not phone your Ford Tractor and Equipment Dealer right now for detailed specifications?

### **TRACTORS AND EQUIPMENT FOR 101 INDUSTRIAL JOBS**

INDUSTRIAL TRACTOR AND EQUIPMENT DEPARTMENT, FORD MOTOR COMPANY, BIRMINGHAM, MICHIGAN

*Cable clamp*

*2" x 4" Safety rail*



*This project extends for 2.3 mi and includes a reinforced concrete viaduct 1,874 ft long, seven plate girder bridges, and 271,000 cu yd of earthfill embankments. It will carry railroad tracks over seven streets in Freeport, N.Y.*



## Viaduct Job Rolls Right Along



TWO CRANES pour 550 cu yd of concrete in 6 hr to build a reinforced concrete viaduct in Freeport, N.Y. Each crane works with two buckets to complete the deck, column capitals, and drop panels of a 120-ft-long section in a continuous pour.

Hendrickson Brothers, Inc., of Valley Stream, N.Y., is building the 1,874-ft-long structure as part of a \$5.9-million project that ex-

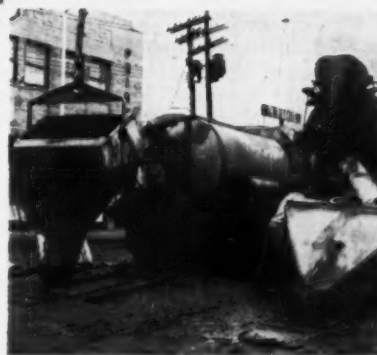
tends for 2.3 mi and will carry railroad tracks over seven streets.

The two cranes work back to back at ground level alongside the viaduct with their booms extended in opposite directions and safety hooks attached to the ends of their hoist lines. Each crane alternates between two lay-down buckets that are supplied by two transit-mix trucks. While the crane hoists one bucket, the other bucket is filled. When the empty bucket is brought back down and placed in front of a transit-mix truck, a workman unfastens the safety hook and the boom is swung over a few feet so that the hoist line can be attached to the filled bucket, which is immediately hoisted away. This procedure leaves the crane no idle time.

The cranes start at the ends of each section and gradually move toward the middle. The pouring is handled by a Bucyrus-Erie 51-B crawler crane with a 90-ft boom and a Lorain MC-524 truck crane

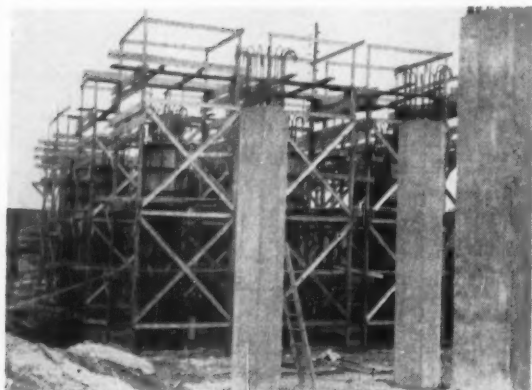
**DECK POUR**—Two buckets, hoisted by cranes at ground level, pour concrete for a deck section. Buckets work from ends of section toward middle.

**NO IDLE TIME**—Crane returns empty bucket. Next workman will unhook hoist line and boom will swing over to lift other bucket, now nearly filled.





**CAPITAL FORMS**—Workmen puts capital forms on hairpins that straddle lag bolts.



**SCAFFOLDING**—Job-built scaffolds form enclosures on top of footings. They position reinforcing steel and support column forms.

#### VIADUCT ROLLS ALONG . . . continued

with a 70-ft boom. The crawler crane handles two 2-cu-yd buckets, one manufactured by Gar-Bro and the other by Insley. The truck crane operates with two Insley 1½-yd buckets.

The pouring procedure is just one of several unusual operations developed for the job by Cornell Kasso, field superintendent.

Unconventional techniques were evident right from the start when Hendrickson began to construct the footings for the 320 reinforced concrete columns that support the viaduct deck. Instead of excavating each footing separately, they made a cut 9 ft deep along the entire length and width of the viaduct deck with four Cat DW21 scrapers and one Euclid dozer. Then they placed the forms and poured the footings, transverse units 10 x 40 ft.

Hendrickson erects scaffolds on the footings to assist in positioning reinforcing steel, to support column forms, and to serve as a platform for workmen while placing concrete. Each scaffold is held in place by guy wires looped around the tops of the upright members and secured to the opposite row of concrete footings.

Job-built devices secure and

tighten the guy wires to the footings. They consist of a ¾-in. Richmond Tyloop, an 18-in.-long turnbuckle, and a cable grip. The Tyloops are embedded in the footings when they are poured. The turnbuckle hooks on to the Tyloop, and the cable grip hooks on to the turnbuckle. The guy wire passes through the cable grip. Tension on the guy wire is adjusted with the turnbuckle.

#### Column Construction

The scaffolding forms an 8½ x 9-ft enclosure on top of each footing. Workmen erect steel reinforcing inside the enclosure, guided by a templet at the top of the scaffolding. Then a crane lowers prefab column forms into the enclosure, around the reinforcing. They brace the ribs of the forms to the scaffolding with boards nailed at each end.

The column forms are octagons, 3 ft wide from face to face, that vary in height from 14 to 19¾ ft. They are constructed in halves, matched and held together with steel bands that fit around the outside. The band is drawn tight by a bolt and nut.

The ribs are circular on the outside, octagonal on the inside.

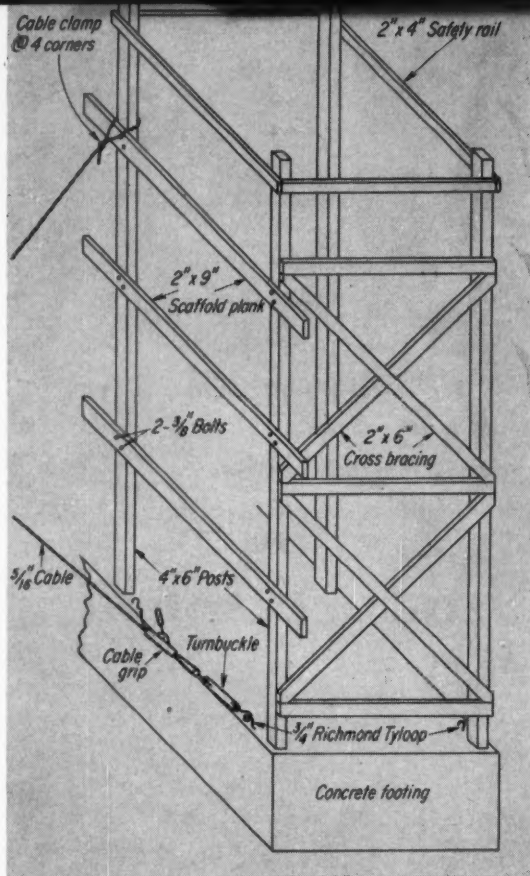
To the inside of the ribs are nailed tongue and groove sheeting, 1¼ in. thick and 4 in. wide. A plywood lining, ¾ in. thick, goes over the sheeting to give the columns a smooth finish. A cable extends along the entire length of each form, passing under the ribs and emerging in a loop at the top. A crane's hoist line can hook onto the loop to hoist the form up over the scaffolding and lower it into place. In all 30 column forms were built, and about 10 columns were cast at one time.

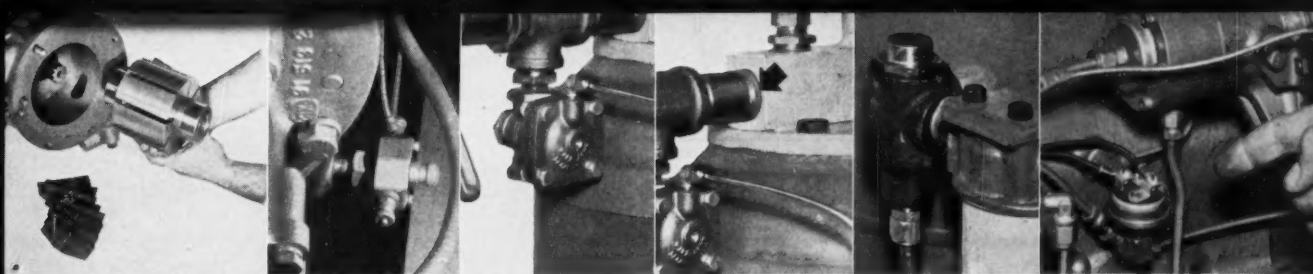
#### Capital Forms

The columns are cast with small holes near the top that play a part in supporting forms for the column capitals. A lag bolt inserted into each hole supports a wood hairpin. The two legs of the hairpin straddle the bolt and the top of the hairpin supports a wood ring that fits around the top of the column. The capital forms rest on top of the wood ring. Since the capitals are poured with the deck, workmen erect the capital forms and the falsework for the deck forms at the same time.

An elaborate timber falsework system overcomes a peculiarity of

*continued on page 150*





A Le Roi exclusive—"double-life" rotors for both low and high pressure cylinders. When vanes wear one side of rotor slots, simply turn the rotor end-for-end. Rotors can't be assembled wrong. Cylinder and bearing retainers are precision mated and dowelled.

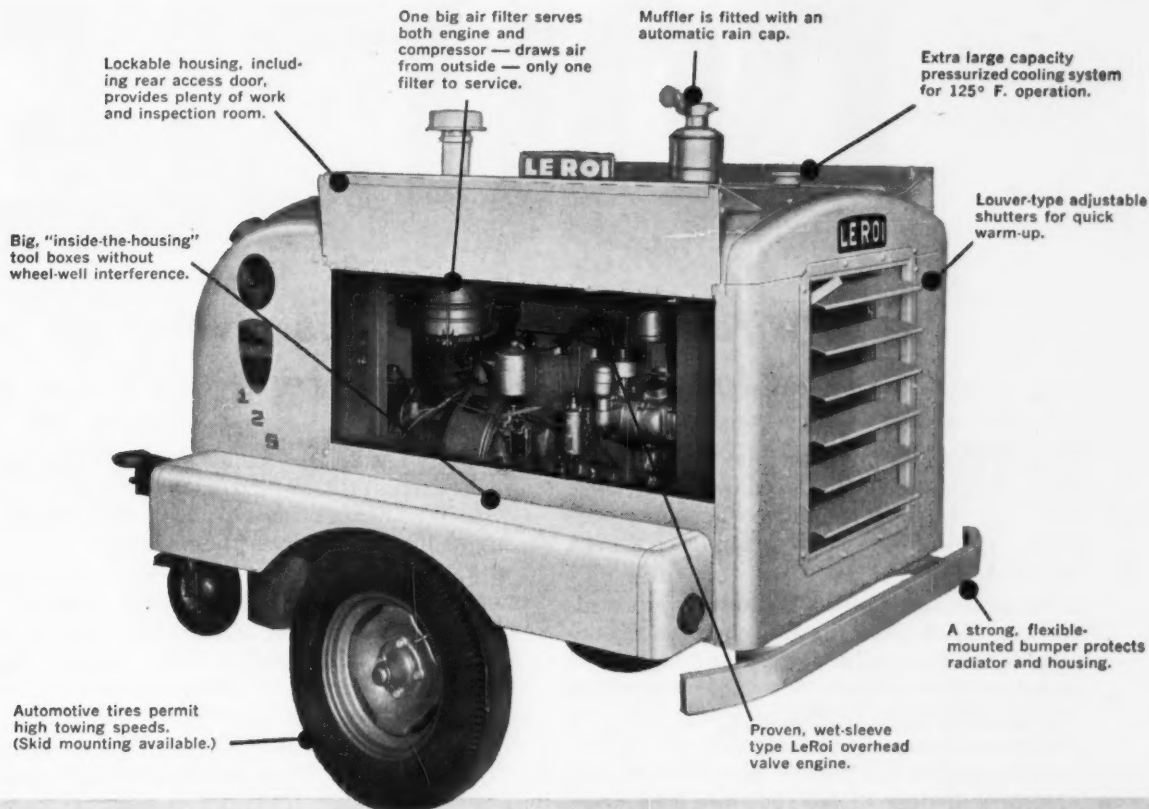
A high air temperature switch is located at the discharge connection of the high pressure cylinder. It immediately cuts off engine if temperature of air-oil mixture in air-end exceeds 230° F.

A "dump" valve instantly releases air pressure in receiver when compressor is shut down. This eliminates possibility of oil backing-up into the compressor air-end.

Orifice, located in receiver outlet, prevents insufficient oil cooling and lubrication of compressor air-end. It automatically insures a minimum of 40 pounds of pressure in the air receiver.

Thermo-by-pass valve insures proper lubrication of compressor air-end during warm-up. Oil is directed to air-end oil pump until oil reaches 130° F. Valve then closes and oil circulates through oil cooler.

Should engine oil pressure drop too low for any reason, this cut-off switch automatically stops engine. Usually found only on larger machines, feature is standard on the 125RG2 rotary.



## LIGHTEST AND SLOWEST RUNNING IN ITS CLASS

This 2280-lb. lightweight compressor is designed to save you time, manpower, and money whenever you need dependable 125-cfm air supply.

It's the lightest portable 125 rotary on the market — built with the operator in mind. One man can easily swing it into position on the job-site. And it's balanced for fingertip liftability — with handles on the tow bar and caster wheel to prevent "knuckle-busting."

Le Roi design is easy on the pocket, too. The rotary delivers 125 cfm of free air at 100 psi at only 1600 rpm — 150 to 400 rpm slower than other makes. This means longer engine and compressor life. What's more, superior air-end accessibility cuts down-time and costs for vane inspection and servicing.

See the 125 rotary at your Le Roi distributor's showroom. Or write for Bulletin 123 to Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin.

**LE ROI**  
**125 ROTARY**  
**COMPRESSORS**



PG-63

PORTABLE AND TRACTAIR® AIR COMPRESSORS • STATIONARY AIR COMPRESSORS • AIR TOOLS



## CF&I-Wickwire develops

# DOUBLE

**New wire drawing technique gives  
you longer-lasting wire rope**

CF&I-Wickwire's premium wire rope—Double Gray—has now been improved by a remarkable new wire drawing technique. This new wire rope—Double Gray-X—provides EXTRA LONG LIFE.

Wickwire's advanced wire drawing process is the joint effort of our research engineers, metallurgists and key production people. They sought to reduce the friction between the wires within the rope itself, thus producing a wire rope with greater resistance to bending fatigue. An important step in Wickwire's new wire drawing process is the use of *molybdenum disulphide*.

"Moly Disulphide" builds a thin, permanent molecular shield around each wire. Coupled with Wickwire's other advanced wire processing techniques, it gives these results:

- *Friction-free interaction of the individual wires in every strand of Double Gray-X—* A molecular jacket of Moly Disulphide on each wire helps cushion them against the effects of bending, crushing and abrasion. As the rope operates over sheaves, for example, the molecular shield tends to prevent the wire surfaces from grinding against each other, reducing friction and wear.





# a superior wire rope

# GRAY-X

- *Smoother surface to the wires*—In any wire, tiny imperfections occasionally form on the surface. These “weak links” can cause premature breaking of the wires and impair the life of the rope. Moly Disulphide helps eliminate any minute nicks, creating smoother-surfaced wires.
- *Higher degree of toughness which is essential to longer wire rope life*—Moly Disulphide greatly minimizes the friction involved in the drawing operation, thus preventing the wires from “heating up”. This assures the correct physical properties for every wire in Double Gray-X and helps the wire retain its original toughness.

Double Gray-X will be made in a wide range of sizes and constructions to give greater operating economy and reduced downtime for all types of rope-using equipment. It will be available soon from CF&I-Wickwire's chain of warehouses and through a network of nationwide distributors.

## EXTRA STRENGTH

In addition to longer life, Double Gray-X gives you the extra strength of Double Gray Wire Rope. Made of extra improved plow steel with an Independent Wire Rope Core, this rope gives 15% higher breaking strength than the catalog breaking strength of an improved plow steel rope with IWRC.

7484

## WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION



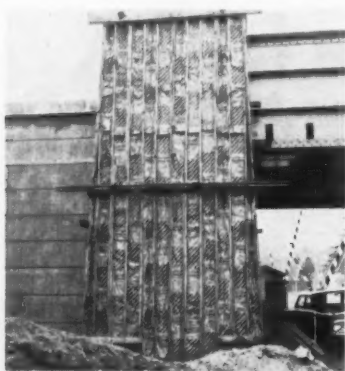
In the West: THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso  
Farmington (N.M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Odessa (Tex.) • Oklahoma City  
Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita  
In the East: WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.)  
New Orleans • New York • Philadelphia



**FALSEWORK**—An elaborate timber falsework system supports deck forms along a 120-ft viaduct section. Two cranes can move trusses from one section to the next in one day.



**TRUSS-TYPE UNITS**—Falsework, constructed on the job, consists of truss-type units that rest on mud sills. Each truss has two bents connected by cross-bracing on the sides.



**CURING**—Insulation bats nailed to studs outside the forms retain heat of hydration.

the structure's design. The viaduct does not have a uniform width; it is constantly widening or narrowing to make room for a railroad station platform. Hendrickson met this situation by building independent truss-type falsework units. Depending upon the width of the viaduct section, a crane places a series of three or four of these trusses, one behind the other in each bay. The trusses rest on mud sills so they can be pulled out easily later on.

Each 120-ft viaduct section has five bays. It takes one day to move false trusses from one section and set them up at the next. To remove

a truss, the crawler crane slides it along the mud sill and sets it to one side. A truck crane lifts it from there and carries it to the new location.

Each truss consists of two bents connected by diagonal bracing on the sides. The bent contains four struts, two vertical and two diagonal, connected to a top and bottom chord. All connections are bolted.

The trusses fit only in the bays. Carpenters build special falsework to carry the deck forms between the columns.

Hendrickson is realizing economies in the construction of the station platform on top of the viaduct deck by re-using some of the forms. Forms for the footings are modified to form the supporting walls of the platform. Deck forms are suitable for the platform, itself. And the upright members of the column scaffolding make stringers that support the platform's forms.

Much of the concreting has been winter work. Wherever possible, Hendrickson cures the concrete by retaining the heat of hydration. This is done on pylons at the ends of a viaduct on the bridges, and on the platform walls by nailing bats of Gold Bond Thermoform insulation in between the studs on the outside of the forms. Heaters under tarpaulins serve where this technique can not be applied.

As the final step in the construction of the viaduct, Hendrickson will pour a concrete canopy over the station platform. The viaduct requires 31,350 cu yd of concrete.

In addition to the viaduct, Hendrickson is building seven plate girder bridges, and they are bringing in 271,000 cu yd of fill for embankments that carry the elevated track at both ends of the town. A Cat D7 spreads the fill as it is dumped by a fleet of trucks.

#### Men on the Job

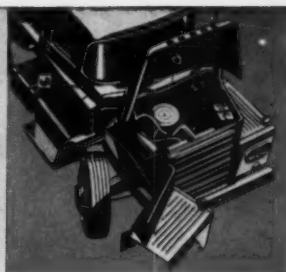
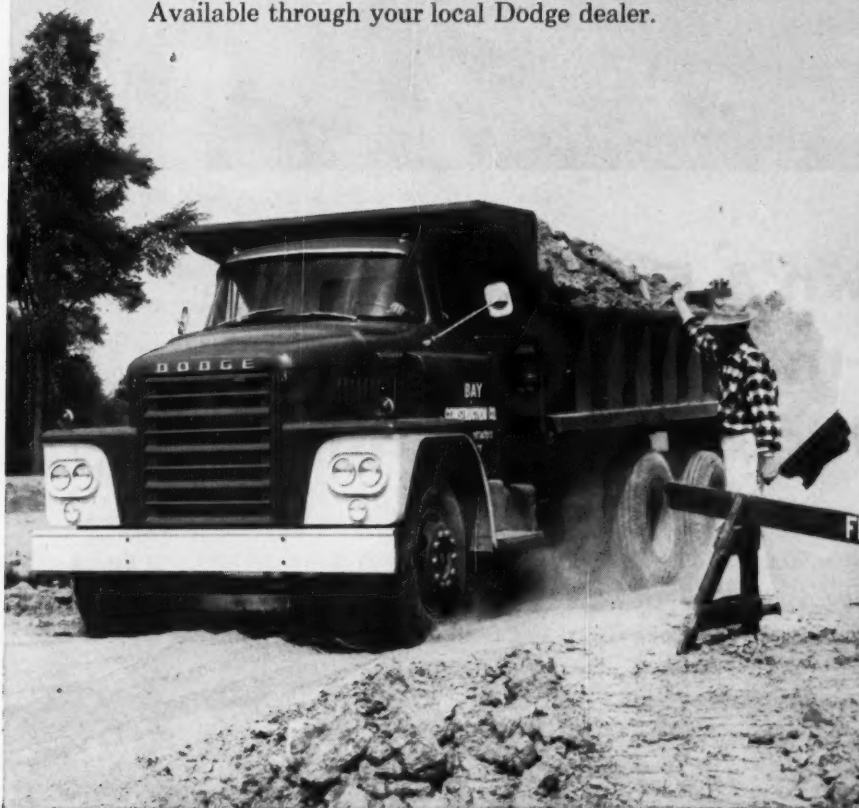
Richard Sennett is project manager; other men on the job are Bill Barotti, project engineer, and Johannes Olsen, carpenter foreman. All work is under the direction of the New York State Department of Public Works. Harold Burton is engineer in charge for the state.

## **NEW DODGE** **CAB-FORWARDS** thrive on **tough construction jobs**

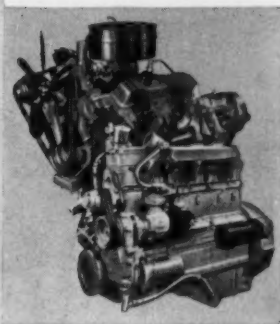
They're built big to work big, these brawny new Cab-Forwards by Dodge. And, to fit any job, there are models ranging from 15 to 53 thousand pounds G.V.W. Available in tandem and single-rear-axle models. Straight trucks and tractors. Gasoline and Cummins diesel power.

Just 89 $\frac{3}{4}$  inches from bumper to back of cab, these heavyweights have handling qualities akin to half-tonners. And their engines are positioned for easiest service access through exclusive Servi-Swing fenders.

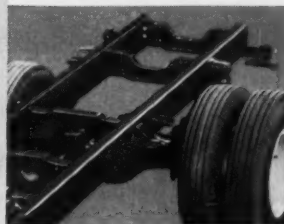
For greatest hauling efficiency and economy on tough construction jobs, your big buy is Dodge. Available through your local Dodge dealer.



**SERVI-SWING FENDERS** open out at the pull of a latch to let a man walk right up to the engine for unrestricted servicing. This exclusive Dodge feature spares you the extra cost and bother of a tilt-cab model.



**NEW GAS AND DIESEL ENGINES** let you pick the kind of power best suited to your requirements. Gas V-8's from 178 to 228 hp.; economical Cummins diesels from 175 to 220 hp., up to 743-cu.-in. displacement.



**TOUGH DODGE FRAMES** of heat-treated, chrome-manganese steel provide exceptional load support while reducing excess chassis weight for C800 models and up.

DEPEND ON  
**DODGE**  
TO SAVE YOU  
MONEY IN  
**TRUCKS**

A PRODUCT OF CHRYSLER CORPORATION



## **How Brown & Root utilizes the profit-making advantages of 12 Michigan Tractor Shovels**

Brown & Root, Inc, Houston, Texas, is one of the country's 25 largest contracting firms. Their selection of Michigan Tractor Shovels as a job-site loader is founded on over 20 years experience with all types of equipment, including five years with Michigans.

The firm currently is operating 12 Michigan Model 75A Tractor Shovels. Three of these have backhoe attachments. In general, one Michigan

is assigned to each major contract, but their mobility and productive capacity make even small jobs profitable for a large firm such as this. For example...

### **Trenching— gasoline plant construction**

The machine, pictured, is digging a 6½ ft deep



by 3¼ ft wide trench for piping in a gasoline plant. In this heavy, wet gumbo, the Model 75A digs at the rate of about 20 ft per hour. Its versatility really pays off too. Unit worked at the dump one day, handled sand from the river supply pit the next, dug trenches the next, loaded excess excavation dirt in between jobs.



### Loading—street construction

Here's another typical small job . . . a ¼ mile contract calling for lowering street level, widening, installing curbs and gutters and paving. Existing drainage tile and culverts were removed. The Michigan truck-loaded them for haul to the dump. The 77 hp Model 75A with 1¼ yd bucket and 8,000 lb lift capacity handled all loading of excess dirt and also much of the preliminary grading.

### Clearing, stripping, grading—parking lot

In two days, another Brown & Root Michigan



put this 80' x 200' vacant lot into shape for shell base and asphalt surfacing. After clearing brush, it stripped and loaded 6" to 24" of topsoil. Then it graded the area so the paving crew could move in.

Michigan short-turning radius (17' 5") and power steer made easy work of grading close to buildings, fences and trees.

### 26 mph job-to-job

Mobility paid off too. The Tractor Shovel traveled 10 miles, over city streets, at speeds up to 26 mph to get to this job. No trailer-hauling was necessary. Without the Michigan, a crawler-loader and grader would normally be employed. So, besides the flatbed trailer and truck, the use of at least one machine was eliminated.

### Low maintenance

Equipment men at Brown & Root state that maintenance on the Michigans is very low. Also, they have experienced very little downtime. This speaks very well for the firm's excellent preventive maintenance program, as well as for Michigan dependability.

### We'll gladly demonstrate

One Michigan or a fleet of Michigans may be the answer to *your* problems. Why not let us demonstrate. There are nine models to choose from—3,000 lb to 30,000 lb lift capacities, with buckets up to 10 cu yds.

Michigan is a registered trademark of



**CLARK EQUIPMENT COMPANY**  
Construction Machinery Division  
2403 Pipestone Road  
Benton Harbor 32, Michigan  
In Canada: Canadian Clark, Ltd.  
St. Thomas, Ontario



*One pusher:*  
22.0 pay yards, 45 seconds

## 600 hp Michigan Dozer

When C. L. Hubner Company, Denver, won a pair of adjacent contracts totaling 14.3 miles of divided highway in northern Colorado, they were faced with 2.4-million yds of unclassified excavation. Much of the borrow had to be taken from the *bottom of a flowing creek*. Should they use draglines and separate haul units or pump the water out and use a pusher-scraper fleet? Economics dictated scrapers.

The stream was ditched and water pumped out by sections as a pair of big crawlers, working in tandem, push-loaded 27 yd scrapers. But this method of pushing was costly and Chuck Loser, Project Supr, wanted faster production.

For a year now, his company had owned a Michigan Model 480 Tractor Dozer. It was working in another pit. They called it in.

### 600 hp Michigan Tractor Dozer steps up production

The question was, "Could the rubber-tired Michigan work in the wet, sandy clay?" Its 600 hp was greater than that of the two crawlers combined. Its 104,000 lb operating weight was about equal to that of the two crawlers combined. With power shift and torque converter, dozer-to-scraper contact was smooth. The wide-base, hydroflated 33.5-33 tires took hold. And the Mich-

igan, alone, did what previously took two big crawlers. Another production problem was solved.

### Output of one Model 480 leads to purchase of another

For the first time, the firm had found a pusher that could *by itself* effectively load their big 27 yd scrapers under almost any condition. Later, after many months of experience with this Michigan, Supt Loser said, "Our Michigan many times has demonstrated its ability to handle large scrapers. Its speed, torque converter and power-shift transmission have sure helped us increase production." It only seems logical, af-



## replaces tandem-crawler team

ter this experience, that a firm of Hubner's size could benefit by owning *two* Model 480's. And they have. A second Michigan was recently purchased.

### 2 Michigans load 12 scrapers

The two Michigans today often load a fleet of 12 to 13 scrapers on haul cycles from 600 feet to 6 miles. Pushing 27 yd scrapers, each Michigan regularly loads a scale-weighed average of 22.0 pay yds. Load time averages 45 seconds. Material has been generally sandy clay, similar to that found most anywhere in the country.

### Time study shows \$60 per hr advantage

Michigan efficiency has proved equally impressive with medium-sized scrapers. One day a 65,000 lb crawler, working on another spread, broke down. With truck-like, 28 mph mobility, one of the Michigans sped to the job location and took over. Time studies showed that in the same location, loading the same rough, rocky earth, servicing the same four 19½ yd scrapers, the Model 480 shoved off *four more loads per scraper per hour*. Total: 16 more loads! Conservative load size: 15 pay yds. Figuring 25c dirt, *the faster-pushing, faster-backing Michigan was*

*earning an extra \$60 per hour compared to the crawler!* And this doesn't even count the 2 or 3 extra bank yards the project supt says the Michigan often loaded.

If you have similar big-yardage scraper or dozer jobs, perhaps mobile Michigans can give you similar cost-cutting advantages. Besides the 600 hp Tractor Dozer there are 375, 262, and 162 hp models. Call us for a no-obligation demonstration on your job.

Michigan is a registered trademark of

**CLARK EQUIPMENT COMPANY**  
Construction Machinery Division

**CLARK**  
EQUIPMENT

2403 Pipestone Road  
Benton Harbor 28, Michigan  
In Canada:  
Canadian Clark, Ltd.  
St. Thomas, Ontario





## *High-traction Michigan Tractor Wagons to the rescue*

# **Solved—slow-up due to unexpected plastic clay**

The term "unclassified excavation" can mean many things when applied to earthmoving in Vermont's mountain-rimmed Winooski Valley. It *could* have meant chaos to S. V. Rossi Construction Co, Inc, Torrington, Connecticut, one of 11 prime contractors working in the Valley on Interstate Highway 89.

At first, there wasn't even a hint of the trouble ahead. Rossi's job along

the 11½ mile, \$16 million route into Montpelier *looked* like the "perfect" intersection. Soil tests showed typical Vermont slate and shale, gravel, sand, light clay and topsoil—520,000 yds in all. All hauls were downgrade (average 2%). With luck, the project would balance up without borrow. And ample time was allowed for completion.

Under these conditions, the only new equipment purchased was from Michigan Distributor, Interstate Equipment

and Supplies Co, Montpelier—a pair of Michigan Model 210, 25 ton Tractor Wagons. These rear-dump units were to be used primarily as rock haulers, replacing four 17 yd wagons of another make.

### **Michigan wades through hub-deep muck**

Work went as planned for several weeks . . . then came the emergency! Oozing blue plastic clay, some 75,000





yds of it, all located in one 70 foot deep cut! After a quick conference, it was decided to try dozer-feeding a swing shovel and loading most material into the pair of 25 ton Michigans.

So the dozer, shovel and 262 hp Tractor Wagons went to work. With their wide-base high-traction 29.5-25 earthmoving tires on the prime mover and like-size rock tires on the wagon, the Model 210's waded hub deep into the oozing clay, were loaded, then pulled themselves out for the half-mile run to the fill. Dump was made "sandwich-style," alternating clay with rock from another cut.

#### **Clay: 2,000 pay yds per day**

In an average 10 hour day, the two Michigans thus made a total of 94 trips, moving between 1,500 and 2,000 yards of paydirt.

By working in conditions that "swallow up" most other equipment and traveling at speeds up to 31 mph, the Model 210 Tractor Wagons helped solve a problem which could have caused a serious setback. Additional equipment, originally thought necessary, was not needed.

Charles Rossi, Project Supt, says, "After the blue clay episode, we were

still a good 10 per cent ahead of original schedule."

#### **Emergency over—Michigans return to rock haul—average 3,250 tons per day**

Rossi was quick to get the spread back to normal operation. The Tractor Wagons returned to their quarter-mile shot-rock haul. Each Michigan here made 65 trips a day, averaged 25 tons per load. Total daily production for the pair—3,250 tons.

#### **Save 25% in fuel**

Soon, another saving was noted. Because of the downhill haul, fuel consumption was expectedly lowered on all machines. But the 262 hp Michigans in a 10 hour day burned only 45 gallons each. Smaller 165 hp rear-dumps averaged 60 gal each.

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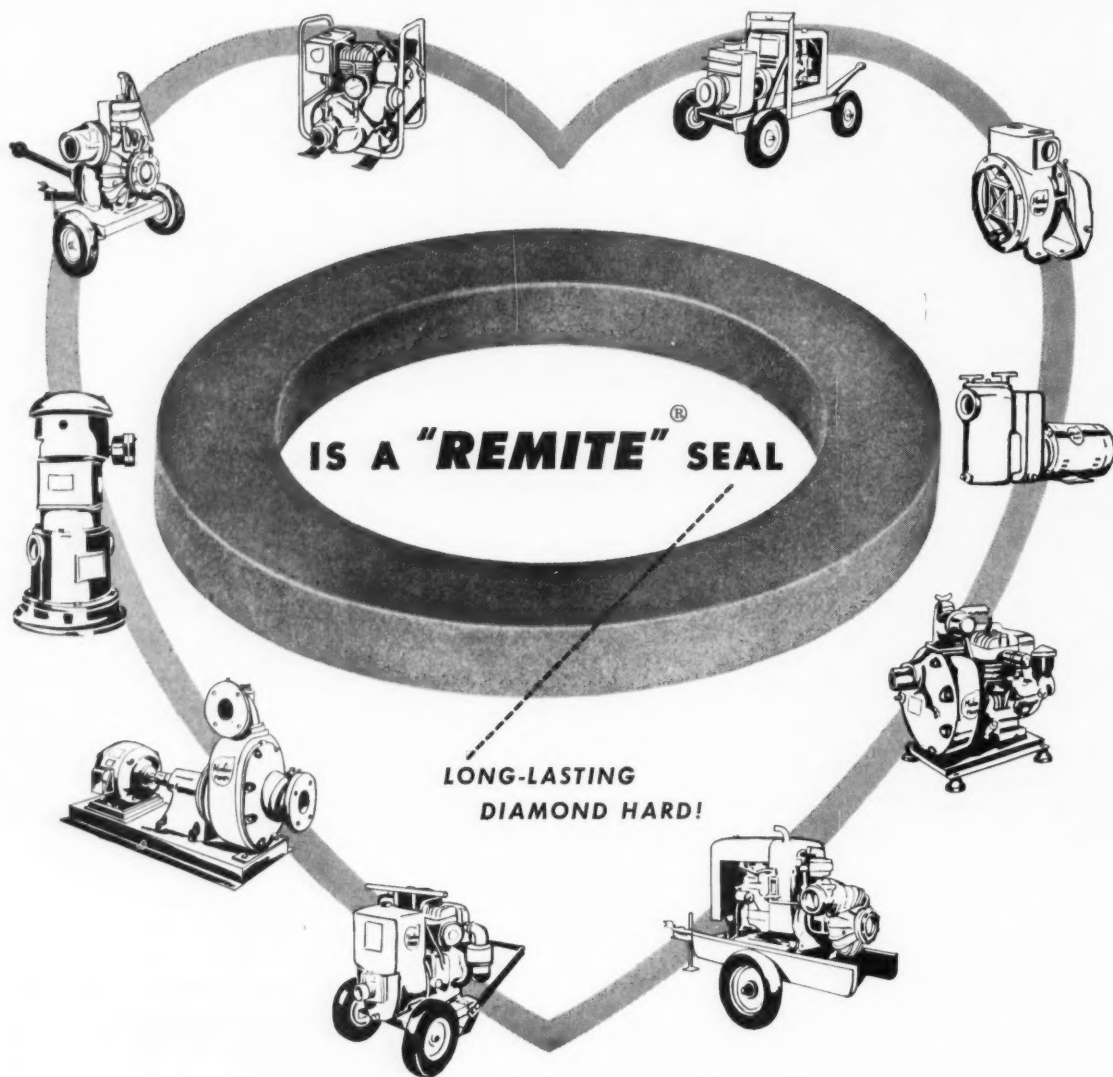


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Yes, Marlow's mechanical shaft seal is designed to keep the liquid where it belongs—inside the pump casing and not in the bearings or on the floor! A unique material, called "Remite," that was developed in the Research Laboratories of Bell & Gossett, helps make this possible. Remite is a material that is almost as hard as a diamond and is compatible with almost every liquid. Both of these properties help to make Marlow's mechanical shaft seal virtually leakproof and one of the finest

available anywhere in the world.

This premium seal is standard equipment on all of Marlow's self-priming centrifugal and end-suction centrifugal pumps. This is just one of many reasons why Marlows offer a dependable and reliable solution to every pumping

problem. Because it is self-lubricating, routine maintenance is almost completely eliminated.

Today, research by Marlow and Bell & Gossett is constantly striving to make a good product even better to serve you with ever increased efficiency.



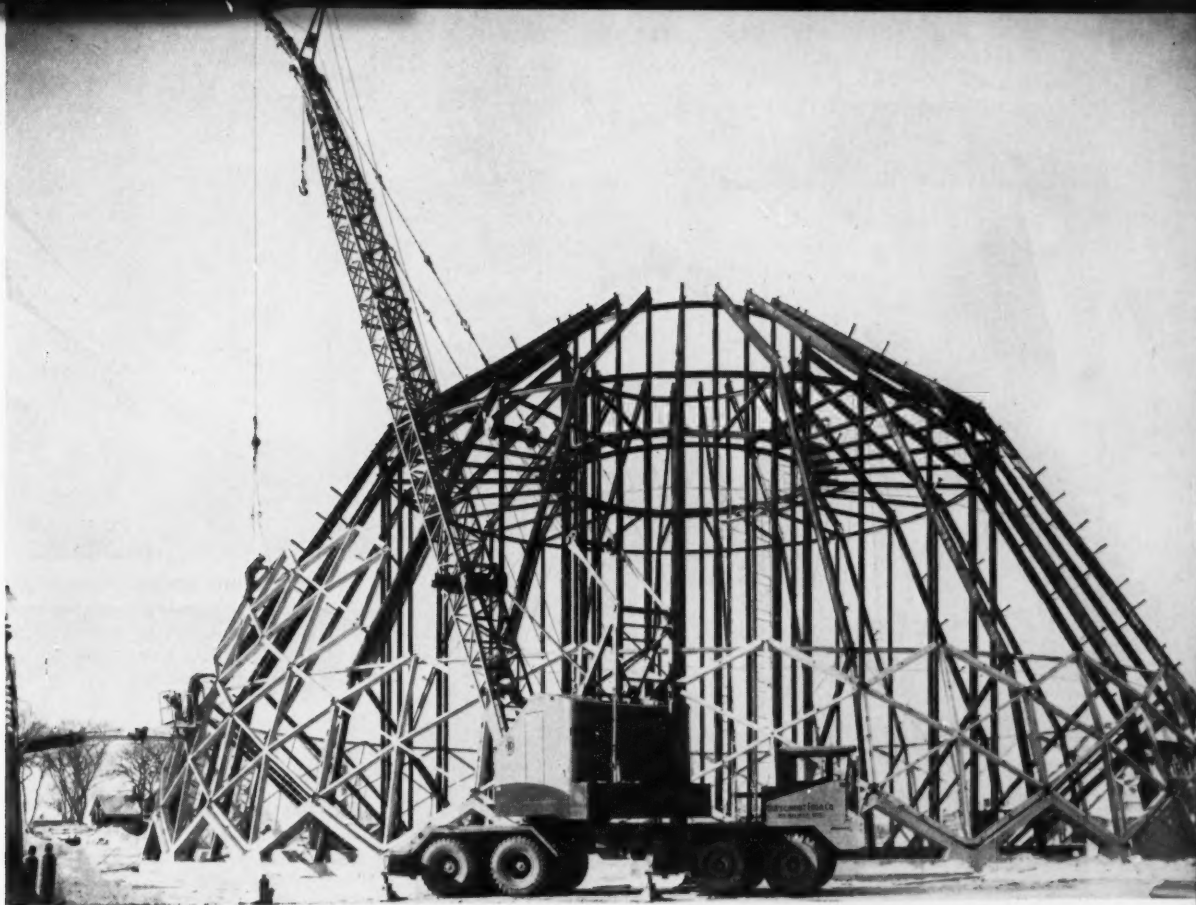
## **MARLOW PUMPS**

DIVISION OF BELL & GOSSETT COMPANY

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**ERECTION**—A Koehring truck crane positions a hexagonal precast frame on the steel falsework that supports the pieces making up to conoidal dome. Each ring in a dome contains 25 pieces.

## Steel Falsework Holds Precast Dome Frames

*Falsework consisting of two concentric circles of 8-in. pipe and slanting I-beams holds the precast frames forming three conoidal domes in Milwaukee.*

STEEL FALSEWORK to support the precast concrete frame of a conical dome in Milwaukee resembles a giant cage in a zoo. But there's no monkey business about it—the odd-looking temporary structure is the key to erecting the 150 precast pieces that fit together to form the dome.

Hufschmidt Engineering Co. of Milwaukee, the subcontractor who is casting and erecting the precast elements of the dome, had

to put up the falsework before placing any of the precast units. Two domes so far are under contract; a third dome will be let later. The three domes, connected by concrete passageways, will be used as a botanical conservatory.

Each of the domes will be 140 ft in diameter at the base and will rise to a height of 73 ft from the top of footings to the apex. Six rows of precast frames will reach 69 ft high. Diameter at the top of the precast frames will be 36 ft. An aluminum cap will crown each dome.

The precast frames vary both in size and shape. Pieces that go into the bottom three rows of the conoidal domes are hexagonals varying in height from 18 ft, 3 in. to 16 ft, 10 in. The next two rows contain diamond shaped

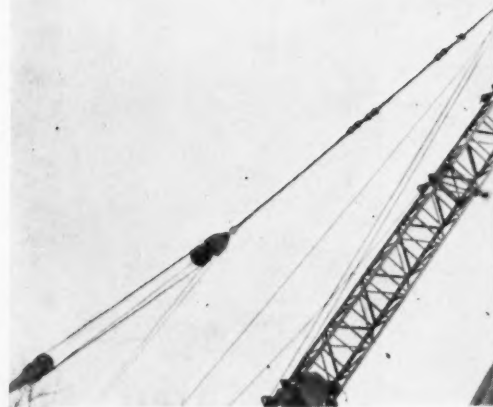
pieces varying in height from 14 ft, 11 in. to 15 ft, 4 in. The sixth and final row at the top of the dome consists of triangular pieces 7 ft high.

Connecting members between the triangular openings in the interior of each piece are 4 in. wide and 8 in. thick. These members belly out from the edges of the piece towards the center to form the curved profile of the dome. There are 25 precast pieces in each ring. When all are in position they become structurally self-supporting.

### **Steel Frame Holds Pieces**

The falsework that holds these pieces in place during erection consists of two concentric circles of 8 in. pipe set on end to hold steeply slanting I-beams that

## STEEL FALSEWORK ... continued



**PLACING PIECES**—Workmen guide diamond-shaped precast frame into position in next to last ring of conoidal dome. Frames vary in size. Straight pieces knit rows together.

**ERECTING FALSEWORK** — Crane swings long section of I-beam with diagonal brace at bottom into place. It will run from top of outer circle of pipes to within 15 ft of the ground.

form a truncated cone. Diameter of the outer circle of vertical pipes is 82 ft; the inner circle, 30 ft. Each circle contains 25 sections of pipe. Height of the pipe sections in the inner circle is 70 ft. Those in the outer circle are 55 ft high.

Curved angle irons run between the pipe sections in each circle to lace them together around the circumference. In the other direction radial sections of pipe, also 8 in. in diameter, run between inner and outer circles. Wood planks form a level platform between the circles at the 55 ft level.

From the top of the inner circle, 12-in. I-beams angle down to the top of the outer circle, where they are bolted. From this point the I-beams extend downward to a section of 8 in. pipe that runs diagonally from the ground to meet the I-beam at a point 15 ft off the ground. The last 15 ft section is also 12 in. I-beam.

The falsework structure took about one month to erect. It will be dismantled when dome erection is complete and rebuilt for the next dome. Hufschmidt par-

tially assembled the falsework in their yard, then completed erection with a Koehring 435 truck crane at the site. All connections in the structure are bolted for easy disassembly and re-erection.

The crane that erected the steel falsework also handled erection of the precast pieces. It is equipped with an 85-ft boom and a 25-ft jib.

### Plates Hold Pieces

Protruding reinforcing bars at each corner of the precast pieces are welded to steel plates held at the proper location on the I-beam members of the falsework system by short sections of 1-in. pipe. Bolts screw into plates mounted on the pipe to hold the precast sections in place until all pieces in a row are erected.

During early stages of the erection, welders reached the corners of each piece where they welded the reinforcing rods to the backup plates in the basket seat of an Elliot Hi-Reach mounted on an International B-160. Fully extended, the boom of this rig reaches 60 ft. When the structure outgrew this rig, the welders used

ladders and wood platforms to reach their work. Three 200-amp welders, two Hobarts and a Lincoln, were used on the job.

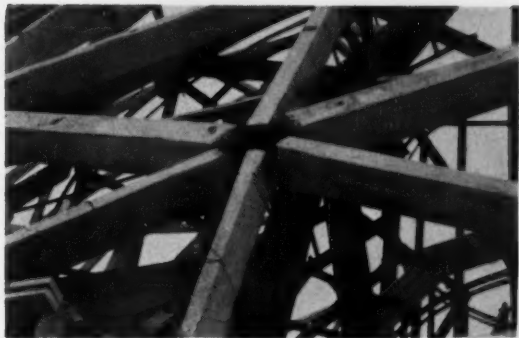
### Checking Location

Job superintendent Jim Quinn carefully checks to make sure all pieces fit together properly. His crew checks the distance of each piece from the center of the dome, as well as the height above the base. To keep the 15-lb plumb bob used in checking the location of each piece steady while suspended from heights of 50 or 60 ft, it hangs on a wire line immersed in a barrel of oil. To check the side to side placement of the pieces, the crew uses a transit set up at the center of the dome.

Hufschmidt took about three months to erect the first dome, working with a crew of five welders, two operators, two laborers, one carpenter and one cement finisher. They'll no doubt complete the second dome—its footings are already in place—faster now that the crew has some experience with the system.

To knit the three bottom rings of precast frames together, the





**WELDED JOINTS** — Welders connect reinforcing rods protruding from corners of frames to plates attached to 1-in. pipes.

**CHECKING POSITION**—Crew drops 15-lb plumb bob from peak of frame into oil drum to check height and radial position.

design called for three sizes of straight pieces to be placed vertically in the gaps between top and bottom of frames in adjoining rows. Similar straight sections span the space between the diamond-shaped pieces in the next two rows.

Hufschmidt cast all the pieces at the job site. They completed casting all 150 precast frames and the straight pieces required to knit them together before starting erection.

They built a reinforcing rod templet for each shape. Two 1½-in. rods reinforce each 4x8-in. member of a precast frame. Workmen treated the forms with grease to aid stripping. The reinforcing bars, located 1 in. from the sides of the members, protrude from the corners of the frames. A Rex one-bag mixer supplied concrete.

#### **Preliminary Work**

The general contractor, Stevens Construction Co., took care of building the foundations for the domes. They first shaved off the area, taking from 3 to 10 ft of dirt off the top. Then they exca-

vated a 10-ft-wide, 10-ft-deep ditch around the 140-ft-dia base of the dome.

Next they concreted the 12-in.-thick inner and outer walls of the ditch and a 5-ft-wide base slab with a single movable 25-ft-long form section. Bolts running through hollow electrical conduits anchored the forms in place. It took about 3½ hours to pour a section containing about 15 yd of concrete. After the concrete set, the bolts were taken out and forms were stripped and moved to the next section. Then a cement finisher patched the holes.

On top of the outer wall of the peripheral ditch Stevens poured triangular base walls that support the bottom row of precast frames. They also built entrance ways to the dome.

The conservatory will cost about \$3.3-million. It is being built for the Milwaukee County Park Commission.

Glass panes will fill the space between connecting members of the openwork frames, and a plastic envelope will form a thermopane around the dome.

Architect is Donald Grieb; en-

gineer is Charles Whitney. Both are from Milwaukee.

#### **Men on the Job**

In charge at the site for Stevens is superintendent Ken Kelling. W. John Hufschmidt and his brother Jim, top men in the Hufschmidt firm, keep in close touch with their superintendent on the job, Jim Quinn.

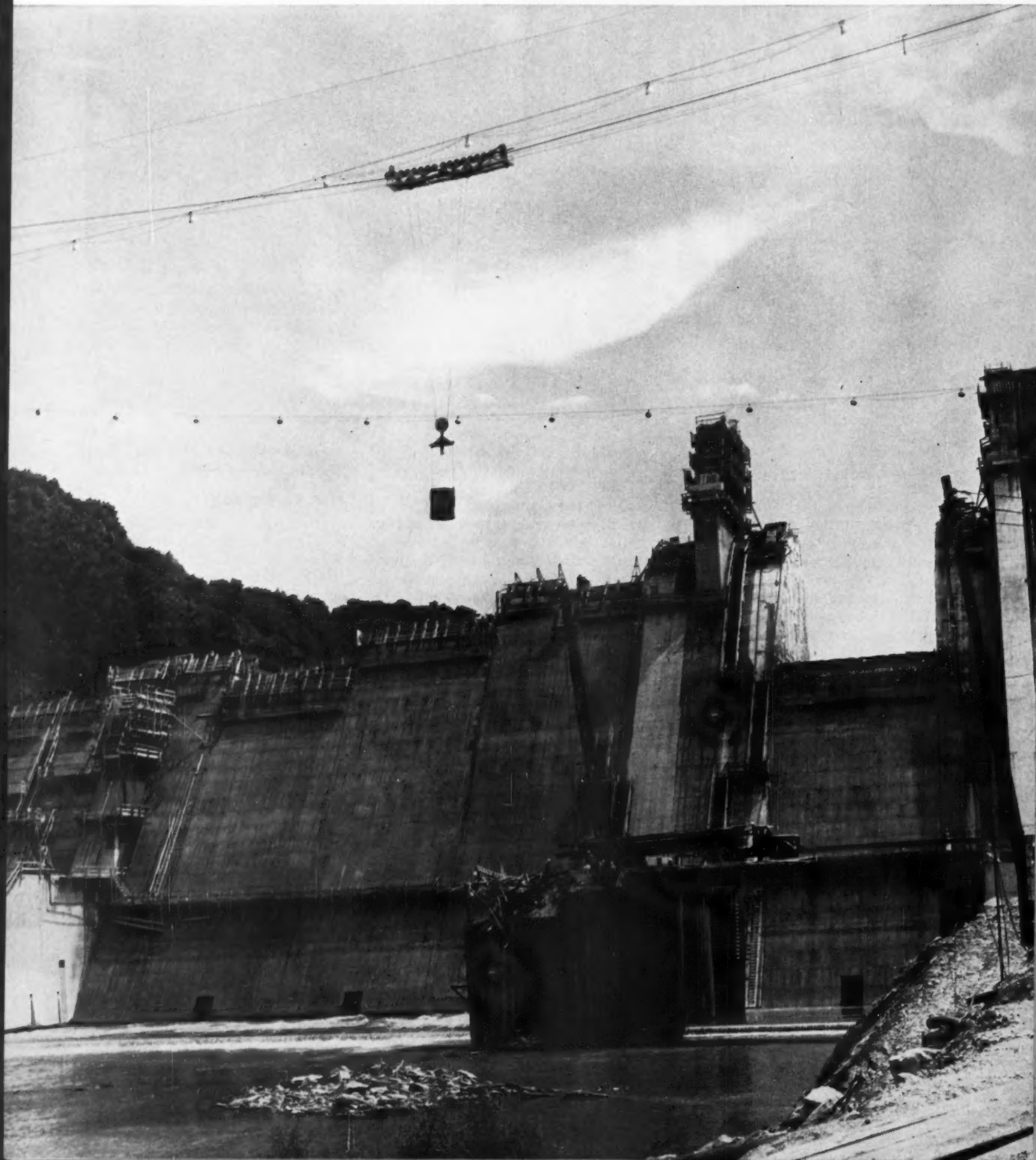


**FOUNDATION**—Triangular base frames on top of peripheral foundation wall will support frames in bottom ring of dome.

USS TIGER BRAND — AMERICA'S NO. 1 WIRE ROPE

## 607,000 cubic yards of concrete delivered by

**SUTTON DAM**—One of the largest flood control dams in eastern United States, located on the Elk River about 80 miles from Charleston, West Virginia. Designed and built under the direction of U.S. Army Corps of Engineers, Huntington, West Virginia. Contractors: Joint venture between Arundel, Dixon-Hunkin. General Superintendent for contractors, Jay Hay; Project Engineer, Ed. Hahn.



# "air express" on Tiger Brand Tramway Cable

Every 3½ minutes this cableway bucket pours another load of "mud" into the mammoth Sutton Dam near Charleston, West Virginia. They're pouring at the rate of 9,000 cubic yards a week—fast time for one 8-yard bucket. When finished, the dam will contain about 607,000 cubic yards of concrete.

The main "gut" is a Tiger Brand 3-inch Locked Coil Tramway Cable 1,700 feet long. It stretches between one fixed tower and one moveable tower so that the bucket can reach any part of the dam. This cable was bought new for the job and from all indications will still be serviceable when the dam is completed. Other Tiger Brand Locked Coil Cables have been used on two or more big dams before replacement was necessary.

All over this project, Tiger Brand Wire Rope is doing a stupendous job. On one of the more critical applications, a 3,920-foot endless rope is used to pull the carriage assembly. Because of the hard wear this particular rope must take, they used a 1½" 6 x 30 flattened strand rope made of tough Monitor Improved Plow Steel.

Tiger Brand Wire Rope was also used for the hoist line, button line and take-up line, largely because of its excellent performance on previous dams such as Mt. Morris and Shasta. Mr. Lamar Pearce, Cableway Superintendent, who has had a world of experience on big dams, uses Tiger Brand more than any other make. For more information on wire rope, write American Steel & Wire, Dept. 0161, 614 Superior Ave., N.W., Cleveland 13, Ohio.

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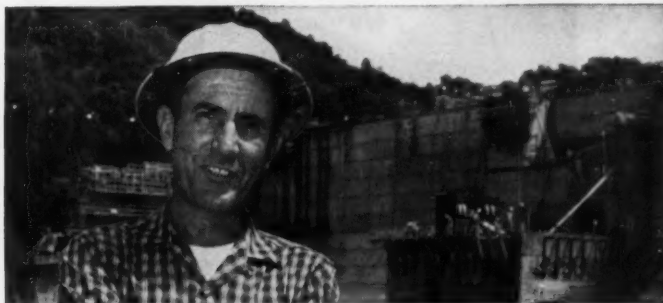
## Why Tiger Brand is your best buy

1. It is made by a company that maintains the most complete research and manufacturing facilities in the steel industry.
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4. It is made by one company, U.S. Steel, and every step of production from ore to finished product is carefully controlled and supervised to guarantee one high standard of quality.
5. Tiger Brand Wire Rope is manufactured by the foremost single wire rope producer in the country.

◀ **Concrete delivered by aerial cableway**—the cheapest and fastest way to haul materials needed for the dam.



**Main Gut**—USS Tiger Brand 3-inch Locked Coil Cable with smooth surface for efficient operation. Interlocked construction holds each wire in its proper position.



**Lamar Pearce**, Cableway Superintendent, who knows from experience that Tiger Brand Wire Rope is safe and dependable.



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# MOVING DAY



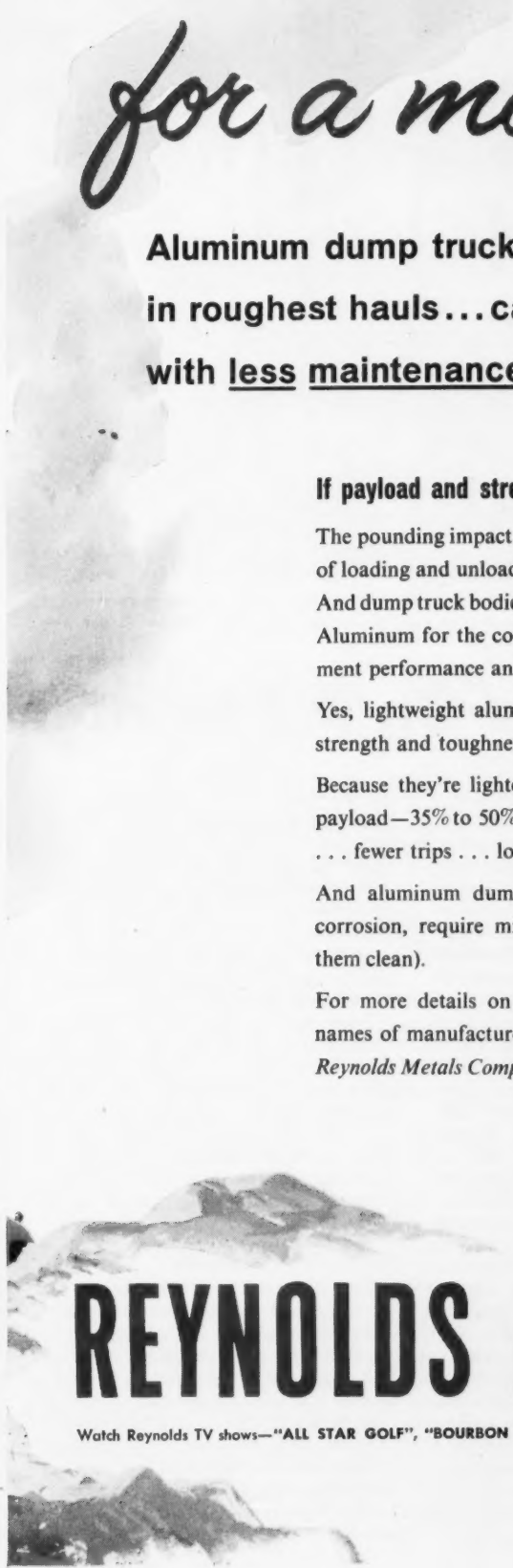
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**Aluminum dump truck bodies prove their toughness  
in roughest hauls... carry more payload...  
with less maintenance**

**If payload and strength is important to you, consider this:**

The pounding impact of tons of rock . . . the abrasive wearing action of loading and unloading . . . this is the beating a dump truck takes. And dump truck bodies and trailers are now being built with Reynolds Aluminum for the construction and mining industries where equipment performance and life are closely measured.

Yes, lightweight aluminum weighs far less than steel, yet has the strength and toughness for bruising mining and construction work.

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And aluminum dump truck bodies are naturally rustfree, resist corrosion, require minimum maintenance (a simple hosing keeps them clean).

For more details on aluminum dump bodies and trailers or the names of manufacturers, call your nearest Reynolds Office or write Reynolds Metals Company, P.O. Box 2346-VG, Richmond 18, Virginia.

## **REYNOLDS ALUMINUM**

Watch Reynolds TV shows—"ALL STAR GOLF", "BOURBON STREET BEAT" and "ADVENTURES IN PARADISE"—ABC-TV

Two buildings now rising in Ann Arbor have 15 lift slabs each and are 160 ft high. The contractor claims a U.S. record on both counts.



**LOADING**—Pumpcrete inside shelter pumps concrete through pipe to buildings.



**SHELTER**—Concreting for all reinforced slabs takes place inside two temporary shelters of polyethylene film. On the coldest days the temperature remains above 45 deg.

## Concreting Goes On All Winter



**EXCAVATING**—L-W scrapers and American dragline remove soil for footings.



**FOOTINGS**—Transit-mix truck supplies concrete for footings that support columns.

ADVOCATES of lift-slab construction have been saying for some time that their technique is suitable for high-rise buildings. They also claim that it lends itself to winter concreting because much of the work—the slab casting—takes place in a confined area on the ground. Two 160-ft high lift-slab buildings now under construction in Ann Arbor, Mich., illustrate both of these points.

The buildings are twin apartment towers. Each 70x215-ft structure will have 12 stories plus an upper basement floor, a ground floor, and a roof, for a total of 15 slabs. Long Construction Co. of Kansas City, general contractors for the \$7-million building job, claims that this represents a new record for height and number of slabs.

Concreting crews enjoyed ideal working conditions through a harsh Michigan winter. They poured all the slabs, stacking one on top of the other, under two heated temporary shelters sheathed with polyethylene film. The temperature inside the shelter always remained above 45 deg even though the thermometer

outside neared the zero mark.

Long began working at the site last fall by removing 65,000 cu yd of boggy soil with LeTourneau-Westinghouse scrapers and an American dragline. Then they constructed concrete footings on a sand and gravel bearing stratum to support 72 steel columns, 36 for each building.

Each column rests on a base plate and is secured by 1¼-in. anchor bolts 2½ ft long. Base plate and column are milled so that the column is plumb when it is secured. For each building, the 36 columns are arranged in nine rows, with four columns to a row. This creates eight bays, each 25 ft by 18 ft.

### Four—Piece Columns

Each column is delivered to the job in four lengths, or tiers. Only one tier, 46 ft high, is erected first. A steel erection crew will splice on additional tiers during the lifting operation.

Before any one of the first tier of columns is erected, all 15 steel lifting collars that will be embedded in the slabs later on are placed around it. Collars are four welded steel channels 4½ ft long



**WORKING IN COMFORT**—One of six oil heaters provides warmth for concreting.



**POURING**—Concrete emerges from pipeline down a chute for accurate placing. With Pumpcrete system, contractor averages 40 to 45 cu yd per hr, five slabs every 10 days.

## For Lift-Slab Job

that form an enclosure 1 ft 4½ in. by 1 ft 6 in. around the columns. The channels are 6 in. high, weigh 18 lb a ft.

A 25-ton Lorain crawler crane tilts the columns to allow workmen to slide on the collars. When a column is erected, the top collar is supported by two steel knee braces bolted to opposite sides of the column web. A series of steel-strap hangers suspends the other collars from this one.

### Temporary Enclosure

The top lifting collars on each column also support the wood framework for the temporary winter shelters, which is 24 ft high at the center crown. The framework consists of 4x8-in. beams that span the width of the working area, 4x6-in. purlins, and 1x6-in. rafters to which VisQueen film is secured. When the top collars must be lowered for embedment in their slab, support for the enclosure is transferred to the column knee brace.

The film is spread across the framework and fastened to the rafters by nailed lath batten strips. In a similar way, VisQueen is nailed to a series of studs to

form the sides of the enclosure. The 4x6-in. studs are nailed to the roof beams at 25-ft centers, and 2x4-in. studs are nailed at 4-ft centers to the outside purlins. Long used 74,000 sq ft of the film to enclose the two buildings.

### Oil—Burning Heaters

Six Master 125,000-Btu oil heaters provide the primary heat in each shelter. But the concrete's heat of hydration also warms the air. And when the sun is out, the shelter acts as a hothouse, raising the temperature as high as 85 degrees. Snow never collects on the roof; it melts, runs off.

All concreting takes place inside the shelter. As the first step in pouring a lift slab, a collar is lowered manually to a cured slab. The collar is blocked up 3/4-in., and a form built of 2x2-in. wood goes on top of the collar.

The slabs have a scalloped edge that is shaped with Economy forms. Each form is 30 in. high and provides enough clearance to cast three slabs. Long erects two sets of forms, one on top of the other, joined by pins that drop through a series of holes in the edges of the forms. The forms are

held in place by ties cast in the slab and aligned by walers.

A Rex Model 200-Double Pumpcrete, housed in another polyethylene - enclosed shelter, handles all the concreting. Transit-mix trucks discharge through an opening in the shelter into the Pumpcrete machine. This pumps the mix through 425 ft of pipe to the area where the slabs are being poured. Separate pipelines lead to each building. The system delivers 40 to 45 cu yd per hr.

Concreting alternates between the two buildings. Three days elapse from the time they pour one slab in a building until they begin to pour the next slab in the same building. While concreting takes place in one building, the forms and reinforcing steel are placed in other building. They average five slabs every ten days.

### Thorough Surface Treatment

One workman spreads Thompson's Waterseal, a combination separating medium and curing agent, that goes on just as soon as the slab is hard enough to walk on. By making this operation the sole responsibility of one man, Long feels it obtains the best possible assurance that the slabs will be properly coated. The workman makes sure he doesn't miss any areas by applying two

*continued on page 170*

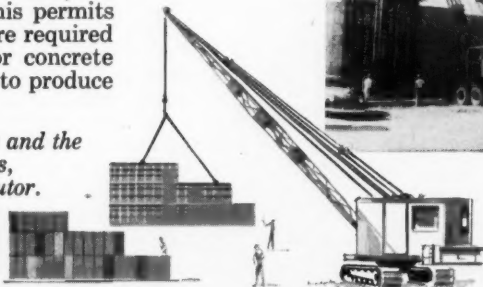
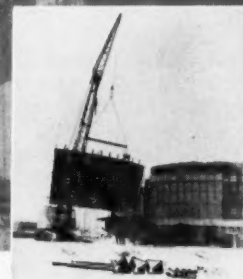
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**A Model 10-30 RD DUO-PACTOR** equipped with 100 psi compactor tires, 84 inch steel roll, and hydraulic rear dump body for quick ballast adjustment, compacting to 95 per cent AASHO T99 on super elevated cloverleaf.

## Wisconsin Interstate No. 94 Contractors smash compaction bottlenecks ... with Seaman-Gunnison DUO-PACTORS!

Compaction time cut as much as 75 per cent, horsepower requirements slashed 30 to 50 per cent! That's the record of four contractors holding five sections totaling 5,000,000 cu yd of fill on Interstate No. 94, Wisconsin state line to Milwaukee city limits.

**This big reduction in compaction cost and time** was obtained with Seaman-Gunnison DUO-PACTORS. Here's the story:

**Rock bottom earthmoving bids** plus rigid density requirements (AASHO T99) made fast, low-cost compaction imperative for Kramp Construction Company, R-W Construction Company, J. R. Griffith Company, and J. D. Boness, Inc. At the start, these contractors owned five DUO-PACTORS from previous jobs, plus a variety of other compaction equipment. Experience soon showed that the DUO-PACTORS obtained the required densities in *one-fourth the time*, with one-half to one-third the horsepower! By season's end, the DUO-PACTOR fleet had been increased to 11, used for all types of compaction—including fill, gravel base, and proof rolling.

**If a compaction bottleneck is slowing down your job** and cutting into profits, *phone us today!* A qualified Seaman-Gunnison representative will gladly help you work out procedures for lowest-cost, high-speed compaction with Duo-Pactor, Impactor, or TRI-PACTOR (Duo-Pactor plus impact vibratory). You'll sharply reduce *both* investment and operating costs!



**A Model 6-19 DUO-PACTOR with 50 hp prime mover**, and an 88-hp Model 10-30 RD with rear dump body, compacting rough fill—two of the three DUO-PACTORS owned by R-W Construction Co., Milwaukee, Wis.

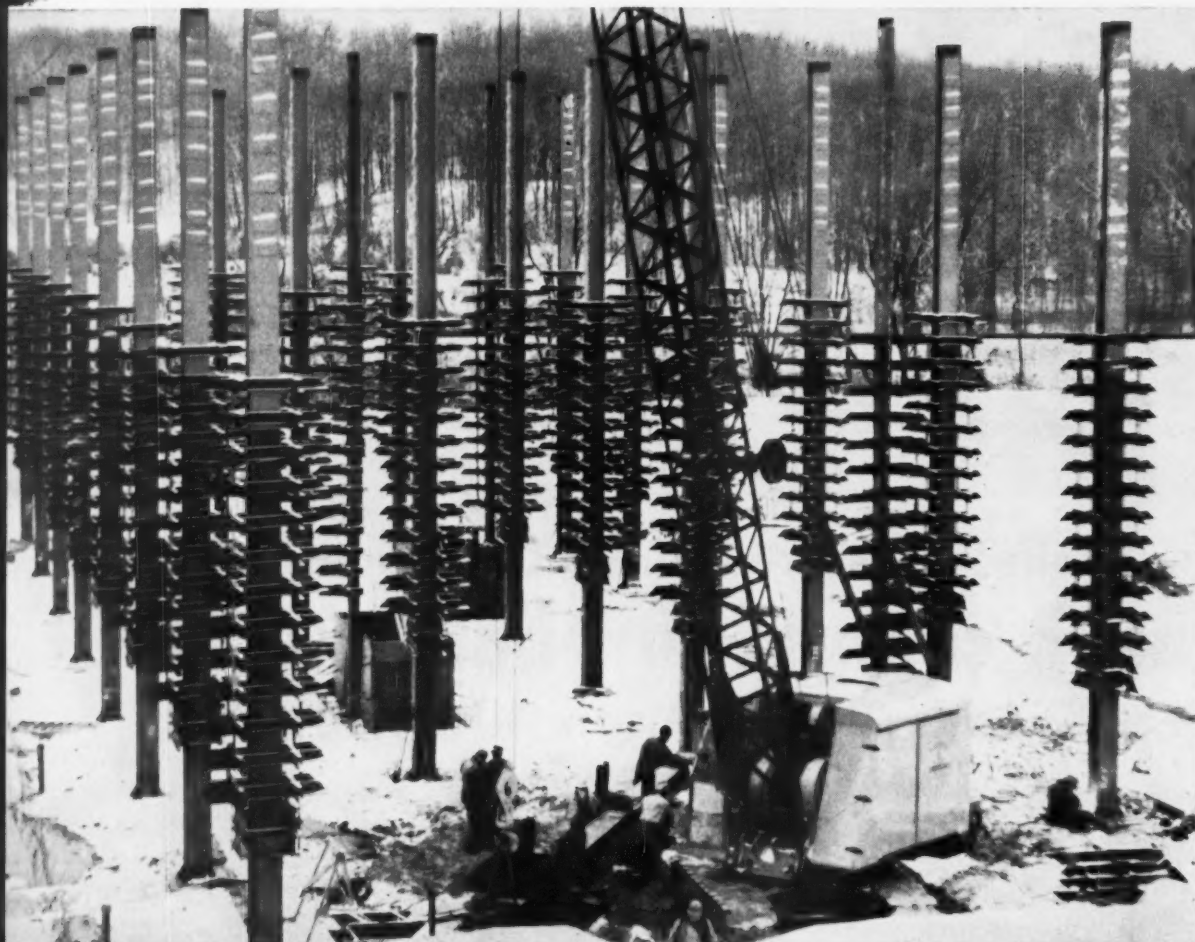
**Compacting gravel base.** Combined action of DUO-PACTOR's rubber and steel rolls produced required density over a wider range of moisture. Model 9-27 DTR with trailing steel roll, one of three DUO-PACTORS owned by J. R. Griffith Co., Racine, Wis.



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- Utility Scraper
- Impactor
- Bituminous Distributors



**COLUMN ERECTION**—Crane raises a column a few feet off the ground so workmen can slip steel collars around it. Then the crane erects column on base plate.



**COLLAR FORM**—Carpenter builds wood form on top of a collar. Collar rests over a cured slab on a board, 3/4 in. thick. Next, reinforcing steel will be placed.

coats. For the first coat he works back and forth across the width of the slab and for the second coat he works across the length of the slab.

After all 15 slabs for a building are cast and cured, the shelter is removed and the lifting operation is ready to begin.

Lifting is under the direction of Skyhook Lift Slab Corp. of Overland Park, Kan. All equipment is automatic and of the latest design developed by the International Lift Slab Corp.

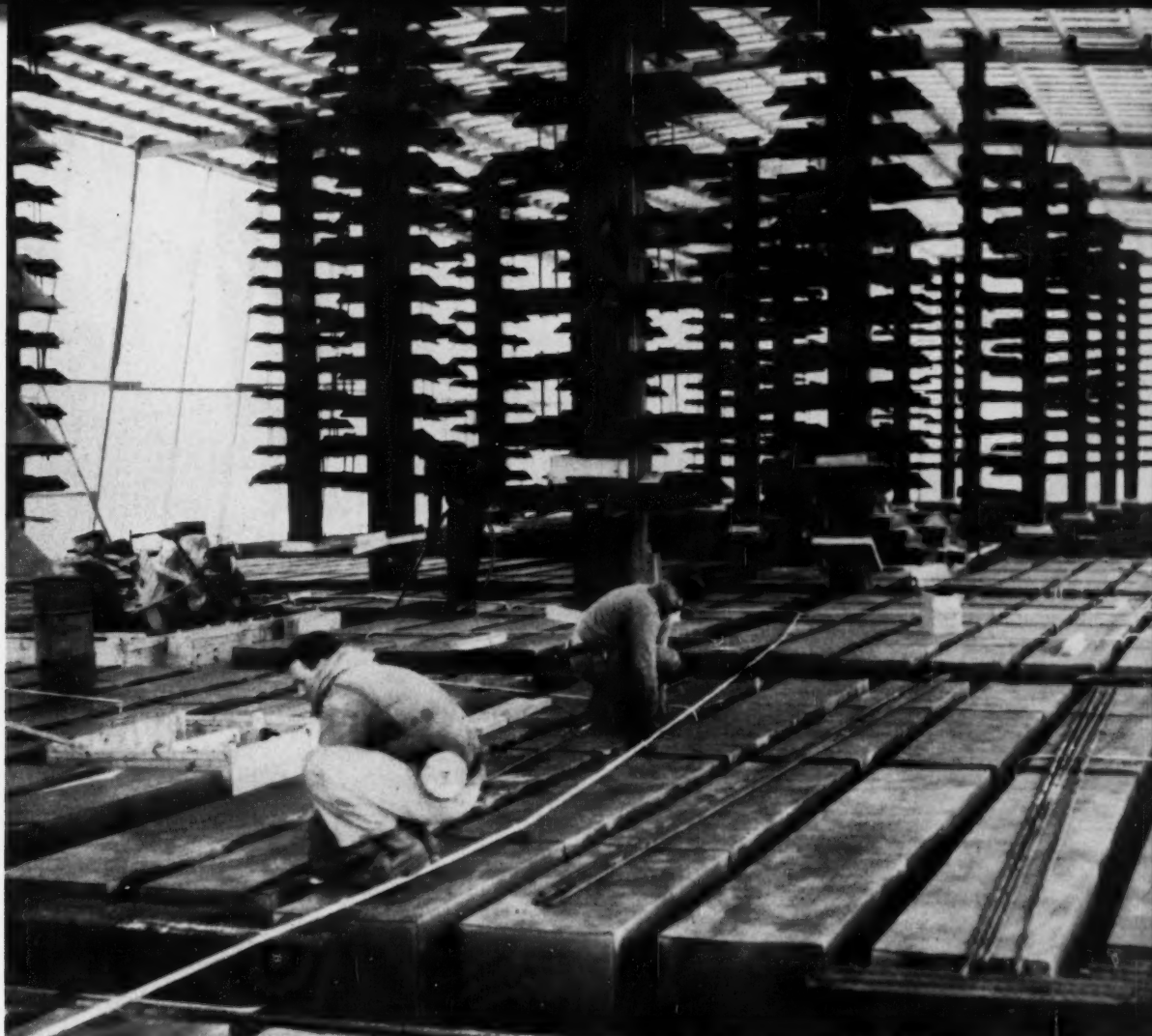
Hydraulic jacks seated on top of each column lift the slabs. All 36 jacks for each building are controlled by one console. They are so connected that each lifting cycle must be completed by all the jacks before the next cycle can begin. This control insures that the slabs will always be level.

The jacks lift two slabs at a time—1,600 tons of concrete—at

the rate of 5 ft per hr. The lifting force of the jacks is transmitted to the slabs by steel rods—one on each side of the column—that attach to the lifting collars.

Getting all the slabs to their final positions is a complex job. It requires raising them to numerous parking places, some temporary and some permanent, on each column tier. When the lifting sequence is completed on the first column tier, the jacks are lowered and a new tier is spliced on. As the slabs are raised up the four tiers, they eventually reach their permanent positions. There they are secured and the rods of the jack are transferred to the slab on top of it, which is moved up alone.

When a slab reaches a proper parking height, it is supported on the columns by inserting a bearing wedge horizontally under an exposed section of the lifting col-



**JOIST-VOID SLAB**—Each building has two joist-void slabs that are cast on cardboard forms. All slabs measure 70x215 ft. Others are flat and 9½-in. thick.

lar and on top of a shear plate shop-welded to the outside of the column flanges. Both shear plate and wedge have 1:12 slopes so that the wedge can be tapped in place with a hammer. The wedge is thicker than the shear plate so that it extends out far enough from the face of the flange to support the collar. If a permanent connection is to be made, the wedge is welded to the plate and the collar.

Each tier of columns is smaller than the one under it. To compensate for this, the shear plates and wedges become progressively thicker on each tier. All the columns are nominal 14-in. WF beams, but the bottom tier weighs 237 lb per ft, the second tier 176 lb, the third 127 lb, and the fourth 87 lb. From bottom to top, the shear plates have a graduated thickness of 5/8 in., 1 in., 1 3/8 in., and 1 3/4 in. The wedge bars

increase in thickness from 1½ in. to 2 in., 2¼ in., and 2 5/8 in.

Some of the shear plates serve as temporary parking places, some as permanent, and some as both. The first column tier has nine shear plates, the second has eight, the third has six, and the fourth has four.

When all the slabs are in place, another connection is made by welding a plate, 1 ft long, 2½ in. wide, and 3/8 in. thick, to the top of the collar and the flange of the column. Then concrete is poured to fill the enclosure around the columns.

B. R. Sloan is field superintendent and Willard Reeder is field engineer for Long. Bob D. Campbell of Kansas City is lift-slab consultant. King & Lewis of Detroit are the architects and R. H. McClurg & Associates of Detroit are the consulting engineers.



**STACKED SLABS**—Workmen smooth edges of stacked slabs while they are still on the ground. Finishing takes place on portion exposed below Economy steel forms.



# Now!... Euclid Twin-Power



\*heaped capacity at 3:1 is 16 yds., at 1:1 slope, 20 yds.

HERE'S BIG NEWS for scraper users. The many cost cutting advantages of all-wheel drive are now available in a medium-size scraper, the Euclid Model TS-14. With Twin-Power and a total of 296 h.p. this new "Euc" has already proved itself an outstanding performer. A one-man, one-machine earthmoving spread, it gets more work done at lower cost than any other scraper of comparable size . . . its high productive capacity brings a better return on investment.

Like the widely used 24 yd. "Twin", this new Euclid has a separate Torqmatic Drive and power train for each axle. It self-loads in practically any scraper material and with a pusher is a big producer on even the toughest jobs. There's plenty of power and traction to pick up a heaped load in a hurry . . . pull out of the cut fast . . . and highball on the haul and return.

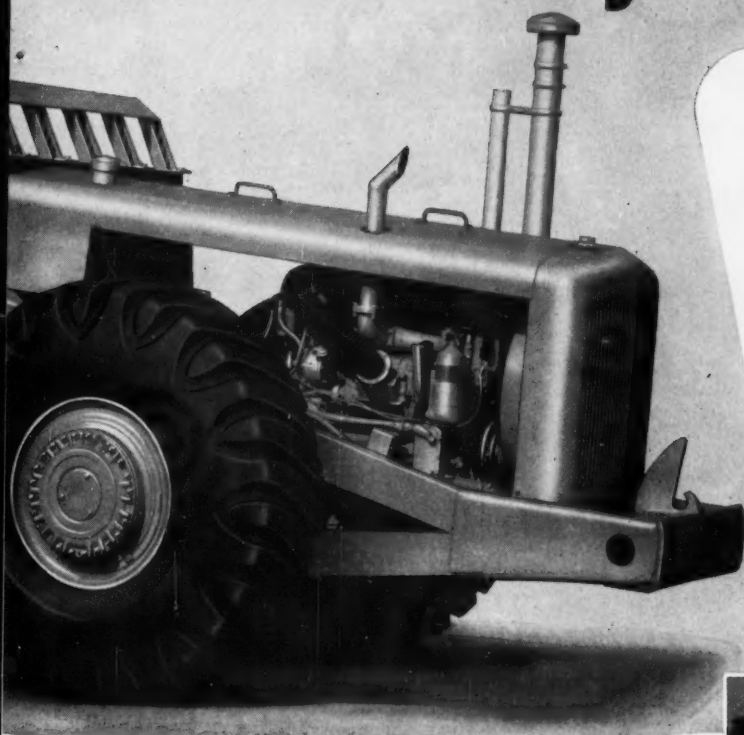
The TS-14 works on grades and under adverse job conditions that stall other scrapers. Its ability to do a wide range of work — without pusher assistance — makes it the most versatile scraper in its class. This new "Twin" can lengthen your work season and give you a bidding advantage on that next job. Get the facts and figures from your Euclid dealer.

**EUCLID** Division of General Motors • Cleveland 17, Ohio

**Check the advantages of all-wheel drive  
in this new 14 yd. Twin-Power scraper!**



# in this 14 yd.\* scraper!



**TS-14 features that cut  
dirt moving costs**

**2 engines — 296 total h.p.**

**all-wheel drive**

**NoSpin differentials**

**2 Torqmatic Drives**

**converter lock-up**

**20 yds. heaped  
(14 yds. struck)**

All-wheel drive and 296 total horsepower enable the TS-14 to get heaped loads without pusher assistance... make it a one-man earthmoving spread with more versatility than any other scraper in its class. Low wide bowl and four-section cutting edge speed loading and cut cycle time... blade sections are identical, adjustable and reversible.



The TS-14 works independently of other equipment... in the cut and on the fill... has the power and traction to self-load fast and work under adverse grade and job conditions that stop single engine scrapers. Its versatility and work-ability make this new "Euc" a top performer for low cost dirt moving on any scraper job... big yardage projects as well as close quarter work where concentration of equipment isn't practical.

Separate Torqmatic Drives for each axle provide a smooth, steady flow of power. There's no clutching, no delay, and no loss of momentum when changing to any of the 4 forward speeds... speed changes are made by a simple flick of the wrist at the air assist remote control lever. Converter lock-up assures maximum efficiency on grades and long hauls... this direct drive provides more usable power from each engine.



## EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



## Allis-Chalmers Selects Twin Disc Torque Converter for TL-14's Tractomatic Transmission

EIGHTEEN YEARS AGO Allis-Chalmers introduced the first torque converter drive in a crawler tractor. That original unit featured a Twin Disc converter, and the same is true of many present-day Allis-Chalmers construction machines. For the optional Tractomatic Transmission in the new TL-14 Tractolader, Allis-Chalmers engineers have once again incorporated a Twin Disc Torque Converter.

This transmission provides the key advantage of power shifting in a simpler, more economical unit. A direction control lever on the steering column actuates forward and reverse clutches hydraulically—changes di-

rections without clutching, shifting gears, or stopping the machine.

*Since reverse speeds are 30% faster than forward, reversing the machine automatically increases its speed.* This eliminates the usual necessity of shifting gears manually to achieve the same effect.

The Tractomatic transmission has four speeds in both forward and reverse. On short haul loading and stockpiling jobs, it is seldom if ever necessary to change speeds once the proper ratio is selected.

A Twin Disc Single-Stage Torque Converter is an integral part of this transmission. Besides increasing

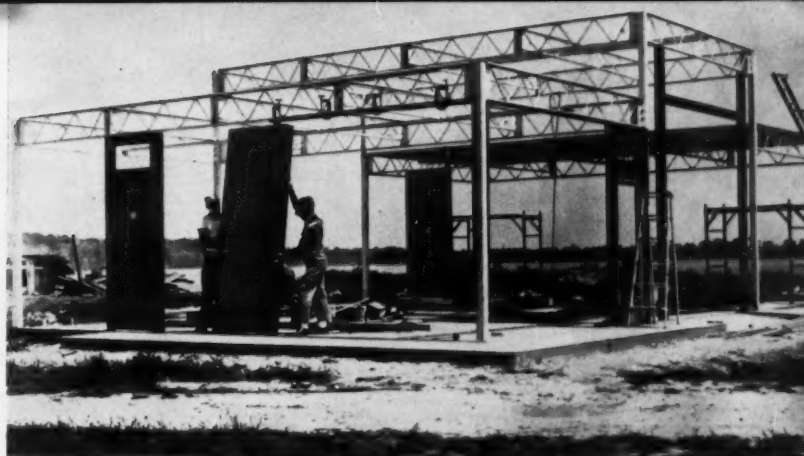
torque automatically as needed, the converter permits rapid clutch engagement and absorbs the shock of the shift in its whirling fluid.

A test of the TL-14 Tractolader at your Allis-Chalmers dealer will demonstrate why so many of America's leading earth-moving equipment manufacturers are standardizing on Twin Disc Torque Converter Drive.



**TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • Hydraulic Division, Rockford, Illinois**

Here are two ways to erect a service station in one week. A station built in Delaware consists of a steel frame covered with aluminum panels. On the West Coast, aluminum panels reinforced at the edges need no columns. Steel beams on top of the walls support the roof.



**ERECTION**—A crew starts putting lightweight wall panels in place as soon as the steel frame is erected. A four-man erection crew assembled the two-ton framework in one hour.

## Building a Gas Station a Week

A HALF DOZEN firms have combined their efforts to develop modular panelized buildings that can be erected in a few days. One such structure, a Sunoco service station near Bridgeville, Del., was completed just one week from the time ground was broken.

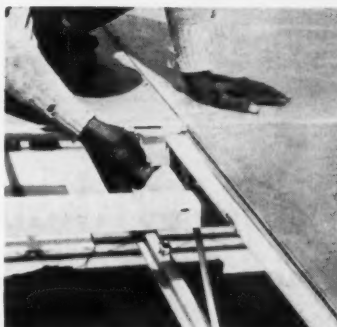
This building system was designed and developed by American Metalcore Systems, Inc., of Baltimore, Md. The basic building block is a lightweight panel with a core of corrugated aluminum. Exterior surfaces are bonded to the core and can be varied to suit specific requirements.

The composite panels act as both interior and exterior curtain walls and roof. The exterior skin is made of aluminum sheets, developed by the Metals Div. of Olin Mathieson Chemical Corp. The sheets are coated with Du Pont's Lucite acrylic lacquer.

On the first day the foundations were dug, and a perimeter form of aluminum was delivered to the site. This form has several functions: it acts as the outside form for the foundations and floor slab; it serves as a framing system for the station; it acts as a premeasured templet for the walls; it serves as a frost wall.

Insulated Olin aluminum panels coated with synthetic rubber make up the form. It weighs about 2½ lb per sq ft.

The panels are assembled with interlocking splines. Angle reinforcements at the corners strengthen the panel joints and act as bearing plates for steel



**ROOFING**—Workman inserts an aluminum bar to complete a spline along a panel.



**SIDING**—Small crew installs aluminum wall panels that weigh 2½ lb per sq ft.

columns at eight column locations. The plates also hold anchor bolts that are imbedded in the column footings when concrete is poured.

Concrete pouring for the foundations and floor slab was completed by the end of the first day.

Erection of the steel frame required one hour on the following day. The steel frame with self-locking connections was developed by Macomber, Inc., of Canton, Ohio. The frame for this 1,300-sq-ft structure weighs less than 2 tons.

Roof and wall panels and doors and window frames were put in place during the next four days.

All panels weigh 2½ lb per sq ft and are 40 in. wide, but they vary in length from 8 to 15 ft.

Maximum clear height from the floor to the underside of the steel girders is 13 ft 8 in. Roof panels span 8 ft and weigh about 4 lb per sq ft.

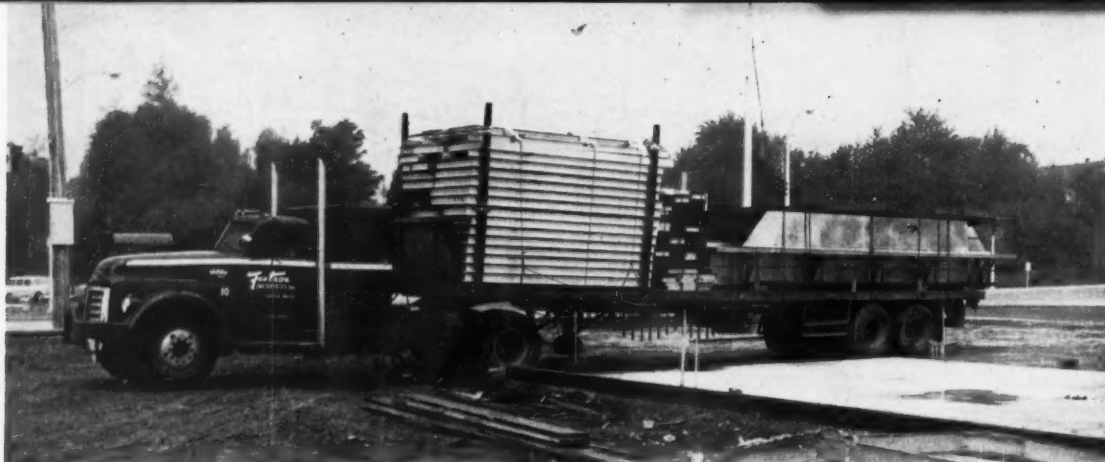
All connecting edges of both roof and wall panels are made of extruded shapes that do not require special tools. The spline in each joint is calked from the outside to make a watertight connection.

The structure can be dismantled and reassembled at another location if necessary.

Coordinating the whole project was Paul T. Day, vice president of American Metalcore Systems, Inc. Henry A. Knott, Inc., a Baltimore contractor, also participated in the development of this building system.

*continued on next page*





**ONE LOAD**—All parts for a prefab service station arrive at the site on one trailer truck. The building consists of aluminum wall and roof panels and steel roof beams.

**BEFORE ERECTION**—The wall panels are unloaded and laid out in their proper order around the concrete floor slab. A frame is not necessary for this prefab system.



**AT THE START**—A workman places a Z-bar along the edge of the concrete footings. This bar will act as a bearing plate for the exterior wall made of aluminum panels.

## Walls Without Columns Speed Building Erection

ONE TRAILER TRUCK can carry all the components for another type of prefabricated aluminum service station developed on the West Coast. Standard Oil Co. of California designed the structures, and Fentron Industries, Inc., of Seattle, Wash., are manufacturing the components.

After the foundations and floor slab are poured, four men can assemble the complete building in five days. One such service station contains about four tons of aluminum.

The panels are formed of aluminum building sheet manufactured by the Aluminum Co. of America. Aluminum extrusions run the height of the building and serve as frames for the panels and windows. Male and female sections along the panels join them together and eliminate bolting or welding.

On the first day of erection, the components are unloaded from the truck, and the panels are laid out around the floor slab in proper order. A Z-bar is

placed along the edge of the footings and is leveled. This bar supports the wall panels.

Erection of wall panels is started by noon of the first day. Once the walls are in place, the crew installs the roof beams. This operation is completed by the second day, and work starts on the interior and the roof deck.

Roof beams are made of steel and support a deck formed of rolled galvanized sheet metal sections. These are about 18 in. wide and can span 15 ft without intermediate supports.

Specially designed Alcoa Alply panels are available for areas where insulation is necessary. These panels consist of a plastic core faced with aluminum.

Erection above the foundations is completed by the end of the fourth day; trim and interior accessories are installed on the fifth day. This structure, too, can be dismantled and reassembled at a new site if necessary. Several of these service stations have been erected in Washington and Oregon.



**AT THE ROOF**—A beam along the top of the wall panels completes the exterior walls. Steel roof beams will rest on the walls and span the entire width of the structure.



**If you keep your EYE  
on the profit picture . . .**

**...YOU'LL CHOOSE  
AN EIMCO!**



**Before you decide  
to invest in any crawler-tractor unit,...**

**ANSWER THIS ONE IMPORTANT QUESTION**



## Have **YOU** seen an Eimco in action?

If your answer is no, you owe it to yourself and to your company to compare the modern Eimco tractor with any other make of comparable, or even larger, more expensive, size. If your answer is yes, chances are you've already ordered, or are operating, a fleet of Eimcos!

**Compare how the Eimco 103 . . . the Eimco 105 . . . or the Eimco 106 lines of tractor units will outpull, outpush, outmaneuver, outperform and outlast any old-fashioned crawler tractors in their fields . . . and with greater flexibility in use.**

The reasons lie in Eimco's unique combination of important, exclusive features, including "Unidrive" transmission, single stage heavy-duty Torque Converter, Independent, Dual Final Drives, Up-Front Operator position, patented Unit Construction and dozens of others, too numerous to list here.

**To up your profits and productivity, let one of Eimco's qualified sales engineers explain all the multiple advantages of the Eimco line of modern tractors. Just contact the dealer or sales office nearest you, or write to The Eimco Corporation, P. O. Box 300, Salt Lake City 10, Utah, U.S.A.**



**The 100 H.P.  
EIMCO 103**

**Tractor - Dozers  
Front End Loader  
Special Steel Mill FEL  
Log Loader**



**The 143 H.P.  
EIMCO 105**

**Tractor - Dozers  
Excavator  
Special Steel Mill  
Excavator and  
Front End Loader**



**The 205 H.P.  
EIMCO 106**

**Tractor - Dozers  
Front End Loader  
Special Steel Mill FEL  
Log Loader**

For details and specifications on any or all of these modern Eimco crawler - tractor units, please write Dept. 1, The Eimco Corporation, P. O. Box 300, Salt Lake City 10, Utah, U.S.A.

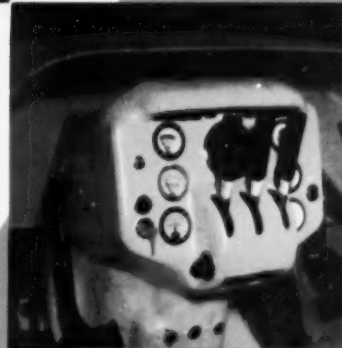
Eimco's assembly lines are unique, in that they permit the production of machines especially adapted to your needs, without assembly interruption.



Unitized "Stress Flow" Construction is a feature of the Eimco 103 line. No bolts or welds. Heavy steel castings assure greater strength, less maintenance, longer tractor life.



Completely automatic, your Eimco is controlled with finger - tip ease. Each handle controls one of the Eimco heavy - duty tracks. Push one forward, the other back, and you are in a smooth, true spin turn! Foot brakes for gradual turns, and no clutch or shift lever to slow operations; tire your operator.



Backed by the skill and resources of the world-wide Eimco organization, Eimco crawler - tractors have proven themselves in use around the World. Eimco's advanced engineering and quality craftsmanship makes possible a full one-year guarantee on the entire tractor.

Look what Eimco's unique and exclusive up-front operator position does in terms of greater visibility, control and safety! Your operator can see what he's doing, where he is . . . not where he was, in terms of work. The engine is center mounted, for better balance and traction. The operator is cooler, safer, in more complete control, at all times.



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Take a tip from nationwide construction records—Firestones lower tire costs per job! Here's why: Firestone off-the-highway tire dependability plus Firestone's Giant Tire Service keeps expensive equipment on the job and working. Firestones are built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires. Firestone Shock-Fortified nylon cord is a natural for off-highway loads—holds impact damage to the minimum. And your Firestone Tire Expert will help you match tires to the job as well as handle all maintenance problems. Turn downtime into worktime with Firestone tires and service! Call your Firestone Dealer or Store today.

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# Firestone

**BETTER RUBBER FROM START TO FINISH**

**TUBELESS OR TUBED**



Super Rock Grip  
Wide Base\*

Super Rock Grip  
Deep Tread\*

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## **PRODUCT LEADERSHIP IN ACTION ...CURTISS-WRIGHT EARTHMOVERS**

Leadership proven in the field is the ONLY kind that is important to your job profits. We mean leadership based on TODAY'S performance, not leadership based on YESTERDAY'S tradition. In these days of tight bidding, you can not afford selection of a machine based on the performance of obsolete models. It takes comparative evaluation of cycle times, bowl factors — production proven under today's new performance standards. That is where your profits lie — and that is where Curtiss-Wright proves its product leadership.

SOUTH BEND DIVISION  
**CURTISS-WRIGHT CORPORATION**  
SOUTH BEND, INDIANA

Distributed in Canada by Canadian Curtiss-Wright Ltd.

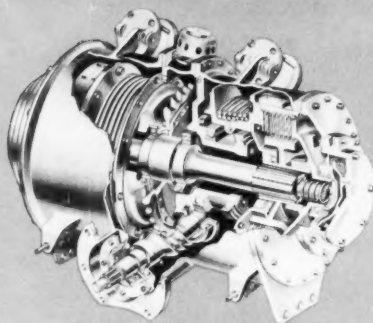
**TURN PAGE**

## BOWL FACTORS— Check Them Before You Buy!

A bowl factor is the ratio between the rated capacity of a scraper and the amount of material it actually carries. For example: a 20 cu. yd. struck capacity scraper averaging 15 pay yds. per load would have a bowl factor of .75 or 75%

$$\left[ \frac{15 \text{ Actual Pay yards}}{20 \text{ Struck yardage cap.}} = .75 \right]$$

To move the most material with the least cost, you need the scraper that has the greatest bowl factor. Looks are deceiving—and the scraper that looks full may not be full at all because of swell—the difference in the density of the material in the scraper versus the material in the bank. In other words, the loaded material will contain voids, due to two major factors 1) the type of material and 2) the lack of bowl efficiency. When the scraper's performance is being evaluated the bank weight of the material must be divided into the weight of the load to obtain the pay yards. These pay yards divided by the rated struck capacity equals the bowl factor. Therefore a scraper must have a high bowl efficiency to provide the greatest bowl factor which is the key to pay yards—your actual measure of production. Check Curtiss-Wright's high bowl efficiencies.



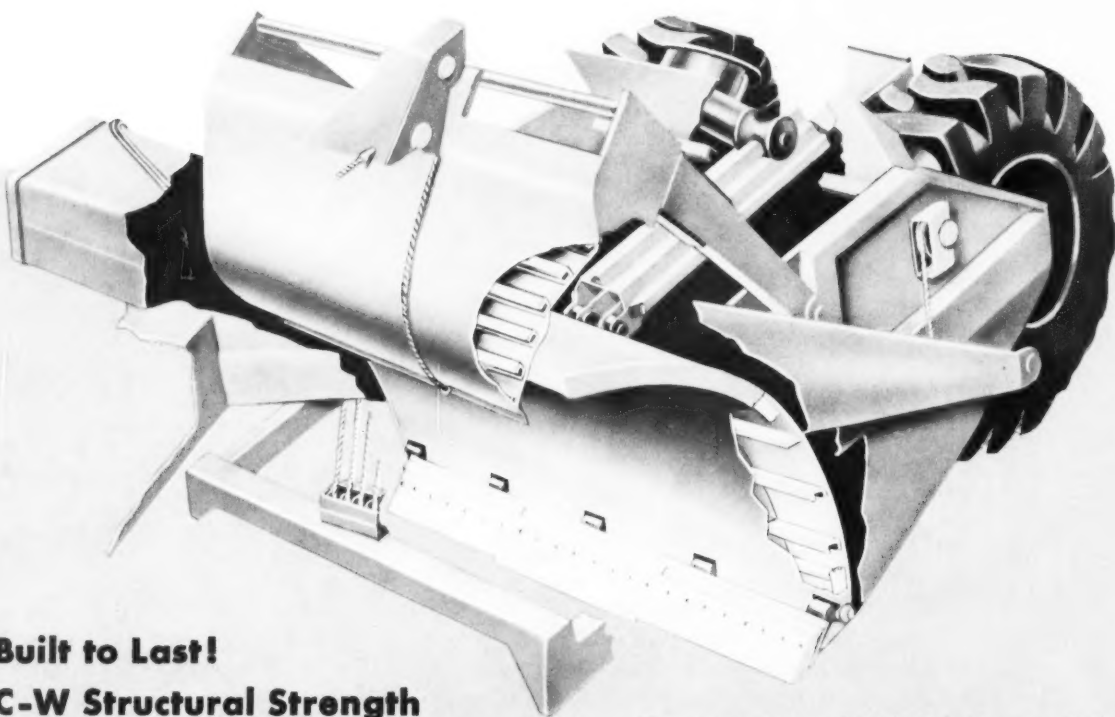
### CONSTANT "LIVE" POWER CONTROL UNIT

The main features of the Curtiss-Wright "live" Power Control Unit are:

(1) The "live" power control unit provides complete control of each operation at all times—giving you better control and faster cycles than with other type units.

(2) The method used by Curtiss-Wright to provide a "live" power control unit made it possible to locate it for maximum efficiency. No compromise was necessary, as with other units, which must be positioned near the transmission.

For a real endorsement of the "live" power control unit, ask any C-W scraper operator. His answer will be emphatic . . . The best power control system available—another Curtiss-Wright performance feature.



**Built to Last!**  
**C-W Structural Strength**  
**Assures Longer Machine Life**



There is no time to "baby" equipment on today's tightly run jobs. Every unit must be built to take a brutal succession of strain, stress, weight and wear. Designing a machine that will hold up under this punishment involves not only metal thickness, but also complex internal structural reinforcement based on an analysis of stresses encountered under the most extreme operating conditions. Your Curtiss-Wright distributor will be glad to show you, point by point, why C-W scrapers stand up to the pounding of a tough job better than any other scraper on the market.

FREE . . . An attractive binder for the complete C-W Job Information series is available from your Curtiss-Wright distributor. Ask for it!

# Prefab Trusses Frame Garage

*An unusual degree of prefabrication helps a New York contractor erect a parking garage to very close structural tolerances. He puts up the structure from one end to the other with shop-welded, vertical trusses.*

PREFABRICATION of the steel framework into trusses proved to be the fastest and most efficient way to erect an unusual mechanized parking garage in New York City.

Because of moving parts required for a completely automatic car parking operation, structural tolerances were extremely small—in some cases less than normal mill tolerances for structural steel. The steel subcontractor was able to achieve this precision by prefabricating the major structural sections under carefully controlled shop conditions.

## Cramped Site

Also, prefabrication eased the perennial New York construction problem—shortage of working space. The building completely occupies the 58x200-ft lot. Next door is a rival parking lot that would insist on the full space rate for any material or equipment parked on its property. In the front and back the building is bounded by busy 42nd and 43rd Streets.

Finally, prefabrication resulted in unusual speed of erection. When the crews weren't slowed by the steel strike, they put up a bay every two days. A bay is 8 floors (81 ft) high, 21 ft long and as wide as the building (58 ft).

The building is a mechanized parking garage being built by Speed-Park System, Inc. William L. Crow is the general contractor



**FAST ERECTION**—Crane adds miscellaneous bracing members to seventh bay. Prefabrication resulted in unusual speed of erection as well as accurate structural framing. When they weren't slowed by steel shortages, erection crews put up a complete bay every two days.

for the \$700,000 building. Francisco & Jacobus of New York, are design and supervising engineers.

## Unusual Structure

The automatic parking system is a patented process. This is the first time this particular method has been tried although several similar systems already are in operation.

The parking system will be completely automatic from the time a car is driven onto the ground floor. A single operator decides what floor the car will be sent to. An electronically con-

trolled elevator system, designed and installed by the Otis Elevator Co., raises the car and deposits it in the proper berth.

The building consists of seven parallel longitudinal sections extending the full length of the structure and to the full eight-floor height. The outside sections on each side are slightly wider than an automobile and provide berths on every level for car storage.

Next in from these sections on each side is an empty corridor that extends the full length and height of the building. Through



each corridor runs an eight-story traveling elevator tower. The tower runs on rails and can move from one end of the building to the other while elevating a car vertically at the same time.

Toward the center of the structure from the elevator corridors on each side is another tier of car storage berths. The seventh or center section contains miscellaneous services.

Cars will drive into the center of the building onto a series of transverse bars spaced 10 in. apart. A second set of bars will move between the first ones like fingers, lift the car, and transfer it to the elevator tower. The tower will then move to a prescribed berth and deposit the car.

Cycle time for each car will be 60 sec or less depending on how far the car is moved. Capac-

ity of the garage is 270 cars. The entire handling operation will be controlled by one operator at a central control panel.

### Steel Erection

Four prefabricated vertical trusses, corresponding to the car-carrying sections of the building, comprise the vertical framing between bays. At each floor level, a prefabricated floor system spans between each pair of trusses.

The 81-ft high trusses are shop-welded in two sections. In the field, crews erect the bottom section, which reaches to about the fifth floor. Then they put on the top section and bolt the two together. All field connections are high strength bolts.

The trusses at one end of the building were erected first to the full height of the building. Then bays were added one at a time along the length of the building. In effect, the building was erected from one end to the other, rather than the usual bottom to top sequence.

Robert S. Mayo Co., Lancaster, Pa., is the steel subcontractor. Eddy Steel Co., Jamaica, N. Y., is handling the field erection.

### Foundations

The foundation subcontractor, Howard Collins Construction Co., New York City, had a choice of the type of foundation to be installed. Depending on soil conditions they could put in either a continuous strap footing under each row of columns or individual spread footings under each column.

Because the building is relatively light, especially when empty, and is subject to large wind stresses because of its height, the main foundation problem is uplift rather than bearing. Collins found that part of the foundation would be on rock, the remainder on good bearing soil, so there would be no problem.

They decided to install 4x4-ft footings, 2 ft deep, and tie them to the rock. At each pier they drilled four holes 6 ft deep into the rock, added Embecco grout (a non-shrinking grout made by Master Builders), and inserted straight steel rods.

Steel erection was completed during March. The garage is expected to be in operation by the end of this year.

Why you'll  
do **MORE** work  
in **LESS** time...  
with this **NEW**  
tractor-mounted

## YORK RAKE



Here's the unit that will speed up both road maintenance and big soil construction jobs... save time, labor.

Designed for use with all 3-point hitch tractors, this new Model RH YORK RAKE is easy to handle, fast on the job. It provides 3 important tools in a single unit... Rake, Scarifier, Grader Blade. Raising, lowering and tilting of rake are done direct from tractor controls... and it turns around on a dime.

Rake works from 7½' to 10' wide... has 5 angle positions... will discharge either to right or left.

Rear mounted caster wheels adjust vertically to regulate working depth of rake teeth.

Scarifier rips up hard ground, tears out stones and roots. Teeth are of heat-treated alloy steel... with reversible and replaceable points.

### TRY OUT THIS YORK RAKE!

The best way to prove the advantages of the new Model RH YORK RAKE-SCARIFIER-BLADE UNIT is to try one out. Write us for name of your nearest Distributor. We'll be glad to arrange for you to test an RH unit.

Grader Blade is ideal for light ditching, building shoulders... spreads material for finish raking. Blade is raised and lowered by crank-cable assembly.



### TOUGH TEETH!

York Rake teeth are tops in toughness. They are made of heat-treated alloy steel... tested to stand far more strain than they'll ever see in actual use. That's why they eat up big soil-working jobs in a hurry. "York-quality" teeth are made only by York, and used only in York Rakes.

### DON'T DELAY... ORDER A NEW MODEL RH RAKE FOR YOUR 1960 JOBS

For complete specifications and prices... and appointment for RH Rake tryout, see your Distributor or write Dept. CM-40.



MODERN  
CORPORATION  
UNADILLA, N. Y.



# RIDES OFF 40 TONS



Say goodbye to hung up units, slowed down cycles, costly operation. The Athey PW20 hauls 40 tons fast and dumps it exactly where you want it—*instantly!*

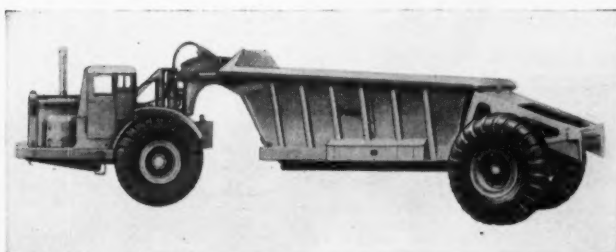
The PW20—built entirely of super-strong T-1\* Steel—has a unique rear door plus big wide bottom doors and a high five foot rear clearance. *All* the load spills out in one neat pile ready for 'dozing. No hanging up on its own load, no carrying back part of the load to the shovel, no stopping to push the rig free. One yank of the dump lever and every

\*Registered trademark, United States Steel Corporation

bit of that 40 tons is gone—*right away!*

With the Caterpillar DW20 Tractor up front, this rig gives you the features you need to cut cycle time: Tough T-1 Steel trailer construction, 35.8 mph speeds, instant dumping *every time*, Caterpillar SynchroTouch Transmission control, sensible cable-hydraulic door mechanism, and the tops in vehicle weight-to-payload ratio.

Get the PW20 facts and figures from your Athey-Caterpillar Dealer. He can show you how the PW20-DW20 team paid off for others.



**SOMETHING NEW!** It's the 35 ton twin brother of the PW20—the PW21 teamed with the Caterpillar DW21 Tractor. All the features of the PW20 plus extreme maneuverability.

**WRITE NOW** for your copy of the "PW20 Job Report"—the on-the-job story of the PW20-DW20 team in action.

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**PW20  
BOTTOM  
DUMP  
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**Athey** PRODUCTS CORPORATION, 5631 WEST 65TH STREET, CHICAGO 38, ILLINOIS

# MOLINE ANNOUNCES THE **MoTRAC**

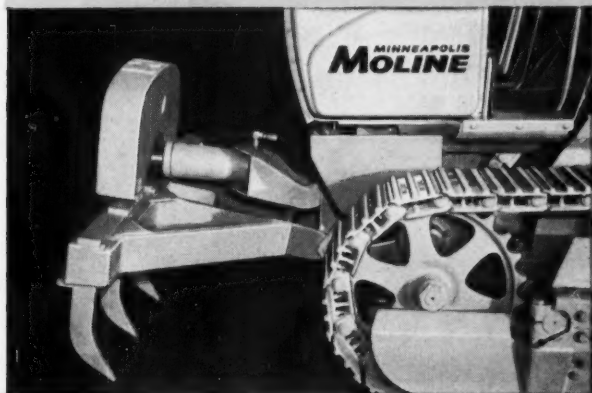


# The all-new all-job crawler with Hydro-Shuttle

## MONEY-MAKING CAPACITY FOR ALL YOUR CRAWLER JOBS!



**DOZER**—The tougher, huskier MOTRAC combines crawler traction, Hydro-Shuttle torque converter drive and Moline-built engine power for bulldozing, stumping and clearing.



**SCARIFIER**—This powerful hydraulic scarifier rips into asphalt or hardpan surfaces . . . teams with the MOTRAC shovel for fast grading and excavation.

Name the work assignments your new crawler must handle. Then see how the MOTRAC tackles them—see how this powerful, easier-handling crawler boosts output on every job!

**On loading**, MOTRAC's torque converter drive with toe-operated Hydro-Shuttle takes you from full-ahead crowding to full reverse at the touch of a pedal . . . smoothly, hydraulically, without shifting. You get faster cycles—more yardage per hour.

**On excavating**, you work with a 1¼ yard bucket, 9000 lbs. of break out force, 59 engine horsepower (gasoline) and 2086 sq. in. of ground-gripping track surface. You get full buckets, pass after pass—new work capacity.

**On grading, backfilling, road bed preparation**—MOTRAC power . . . MOTRAC easy handling get the job done at low per hour cost. You get the long-life assurance of husky Moline-built gasoline or diesel engines, 1000-hour service track rollers, heat exchanger crankcase cooling, oil bath air cleaner with pre-cleaner.

See the new MOTRAC in action—check with your Moline Industrial Dealer now or mail the coupon today!

ROGER HIPWELL—Phone West 8-2771

Industrial Sales Manager, Minneapolis-Moline, Hopkins, Minnesota

- ☐ Send me name of my Minneapolis-Moline Industrial Dealer.  
☐ Send me catalogs on the new MOTRAC Crawler.

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# MINNEAPOLIS MOLINE

*The fastest-growing line of industrial equipment!*

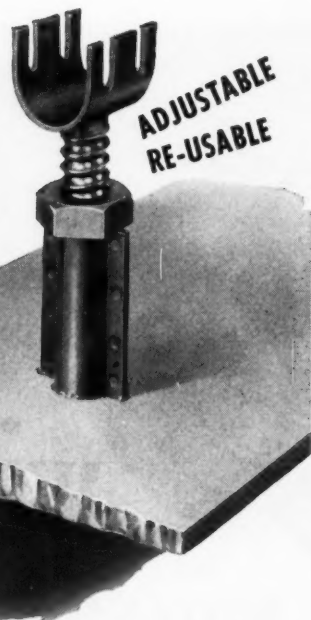
\*Moline Dealers give the best parts service in the industry.

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## Heavy-Duty SCREED SUPPORTS

Pat. Applied For

**For Use with 1 1/4" and 1 1/2" I.D. Pipe Screeds  
and Vibratory Screeding Equipment**



**ADJUSTABLE  
RE-USABLE**



### ADJUSTABLE SCREED HOLDER

Consists of a 1" threaded rod to which is welded a cradle to hold the pipe screed. This cradle is slotted as shown so that the arms may be bent over to secure the 1 1/4" or 1 1/2" I.D. pipe screed. Threaded onto the rods is a half nut which provides the adjustment.

### Especially Designed for Use on Bridges, Underpasses and Overpasses

These Screed Supports are designed to take the heavy loads imposed by traveling vibrating screeding equipment. The Bases for the screed holders are of two types: (1) The Metal Base for use on structural steel members; (2) the Chair-Type Base for use on a plywood deck.

**On Structural Steel:** As shown above, the Metal Base is tack-welded to the top flange on approximately four foot centers. The Screed Holder is set into the base, and adjusted to height by turning the nut. The threads are fast, three to the inch, and of a contour type, non-clogging and easily cleaned.

**On Wood or Plywood Decks:** The Chair Base is set on the deck at approximately four foot centers. It is easily secured to the deck by nailing across the upturned legs. If desired, legs can be supplied of galvanized wire. The Chair Base with holder is shown below.

### Adjustable Standard SUPERIOR SCREED CHAIRS

#### FOR FORMED SLABS 4 1/2" AND GREATER

With re-usable  
screed holders  
using 1" I.D.  
pipe and rectan-  
gular bars for  
screeds.



#### FOR SLABS ON FILL

With re-usable  
screed holders  
using 1" I.D.  
pipe and rectan-  
gular bars for  
screeds.

### PERFORMANCE

Superior's Heavy-Duty Adjustable Screed Supports have been used on turn-pike structures and other projects. Results in the field indicate that this method of supporting screeds provides a simple answer to an otherwise expensive and complicated set up. *Write for Bulletin.*

### HOLDER INSERTED IN CHAIR BASE

Only the inexpensive bases are left in the concrete. The Adjustable Holders are easily removed, together with the pipe screed, because the holders are set, not screwed into the base. The nut fully covers the base opening and prevents concrete from entering.



## SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King Street, Franklin Park, Illinois

New York Office  
39-01 Main St.  
Flushing 54, N. Y.

Houston Office  
4101 San Jacinto  
Houston 4, Texas

Pacific Coast Plant  
2100 Williams St.  
San Leandro, Calif.

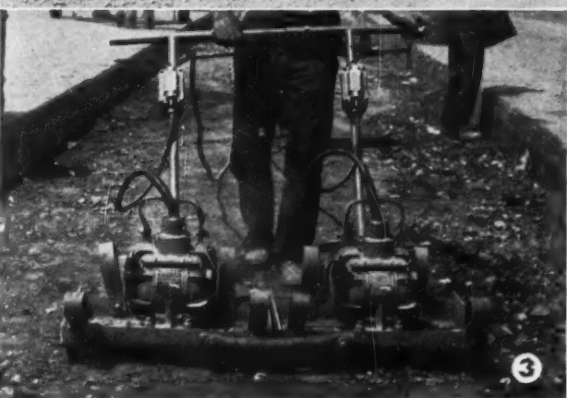




1



2



3



4

## 4 WAYS TO BETTER PAVING PROFITS

### ① JACKSON VIBRATORY COMPACTOR

On any major paving project involving the compaction of granular soils, from sand to large rock, or soil-cement mixes the JACKSON MULTIPLE VIBRATORY COMPACTOR will save its cost in jig time. It's faster in attaining 100% specified density, more economical to operate and maintain, and has far greater job adaptability than any other machine. Vibratory units can be arranged to exactly fit the job — individual units manually operated to reach the otherwise inaccessible spots. The machine operates in either direction — no turning required; and each vibratory unit supplies 4200 3-TON BLOWS per minute.

② JACKSON TRAILER COMPACTOR Employs the same vibratory units as the MULTIPLE (up to 6 in a single workhead, or 8 in two). May be pushed or pulled by any prime mover capable of working speeds as low as 50 FPM. Power plant supplies both single and 3-phase, 110-115 Volt, 60 Cycle, AC, and has many uses.

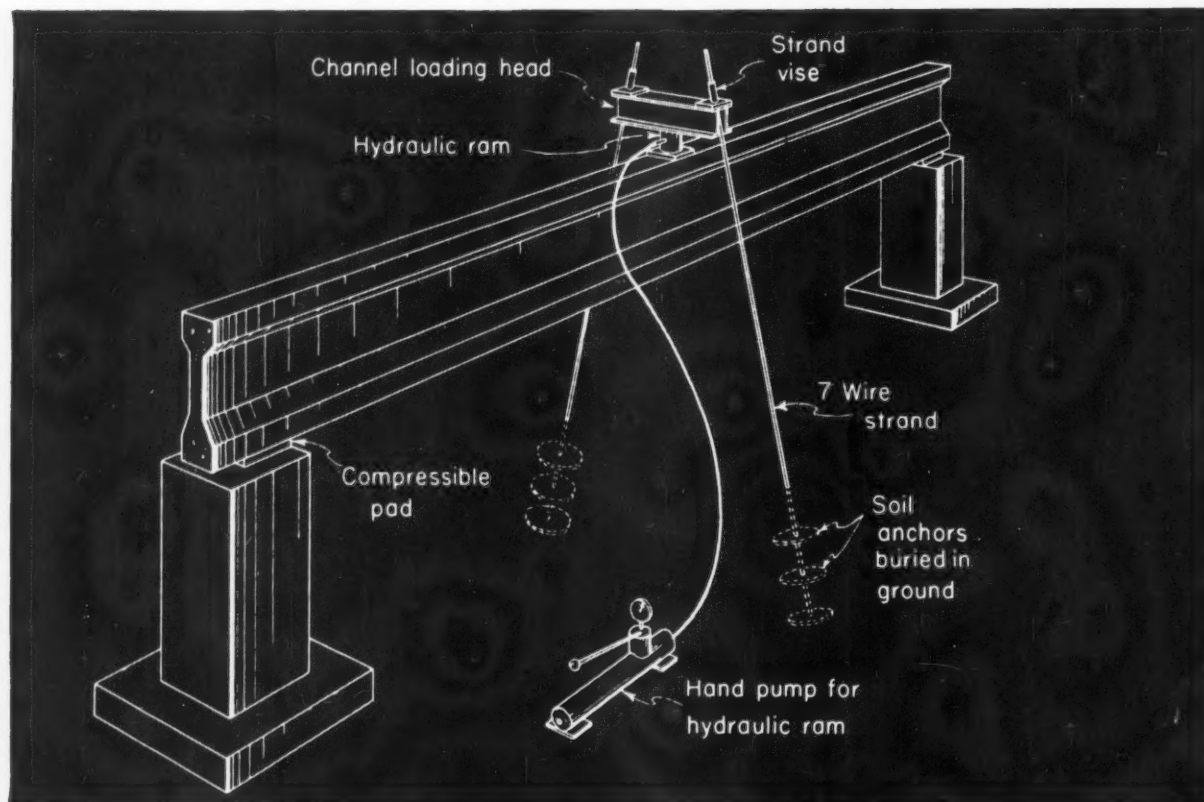
③ JACKSON MANUAL COMPACTOR Uses same vibratory unit as the MULTIPLE COMPACTOR. It's self-propelling, achieves 100% specified density of granular soil in 5" layers at rate of 400 sq. yds. per hour. One man can easily handle hook-up of twin units and double production. Trailer-mounted generator with compactor pick-up feature for universal operation is available. Perfect for a host of applications.

④ MUNICIPAL PAVING For jobs of this type, a JACKSON Vibratory Screed and Portable Power Plant is a very convenient, productive and inexpensive outfit. Strikes off to any crown, undercuts at curbs and side-forms, works right up to and around all obstructions. Two men easily handle it on all slabs up to 30 ft. wide. Rolls back for second passes on 4 rollers.

FOR SALE OR RENT AT YOUR NEARBY JACKSON DISTRIBUTOR  
Name and literature on request.

**JACKSON VIBRATORS, INC.**  
LUDINGTON, MICHIGAN

# A Do-It-Yourself Load Test



IT IS SIMPLE to make a load test on a precast concrete member. All you need is something to apply the load, something to hold it, and something to measure deflections.

A test to destruction requires loads sometimes seven to eight times the design load, so be certain you have adequate support for your test piece. A support that seems adequate at the start of the test may not be satisfactory at very high loads. Place compressible pads between the member and the support. Otherwise large end rotations occurring near ultimate load may cause the member to bear on just a corner of the support member. This will cause spalling of both the support and the test piece, and may spoil the test. If you are testing a deep girder that may tip dur-

ing the loading, place a guiding frame adjacent to the vertical sides. Tipping and buckling can occur instantaneously and without warning.

## How to Calibrate

For loading you can purchase hydraulic rams, hand pumps, and oil pressure gages of any capacity almost anywhere. For \$20.00 you can calibrate the ram and pressure gage in a good testing machine, or you can do the job in a concrete-cylinder testing press. If possible, allow the ram piston to travel out during the calibration rather than just loading against a stationary testing-machine head. In this way you will include the friction effect of the ram packing and gain 1 or 2% in your load accuracy.

To restrain the ram on the

beam or girder you are testing, you'll need a double-channel cross brace, two soil anchors, and two lengths of prestressing strand with proper strand grips. Soil anchors are commercially available, rated by their resistance to pull.

You probably can find scrap pieces of strand in the nearest prestressing yard. Don't use wire rope for this job because the strand grips will cut the fine wires. Be certain that the strand grips are easy to detach after load application — you might have to take up slack in the strand as the member deflects under the test load.

A post hole borer will aid in burying the soil anchors after you have anchored one end of the prestressing strand to the soil anchor with the strand grip. Next run the strand up from the ground to your test member through the double - channel. Once the top strand grips are in place, the restraining device is complete.

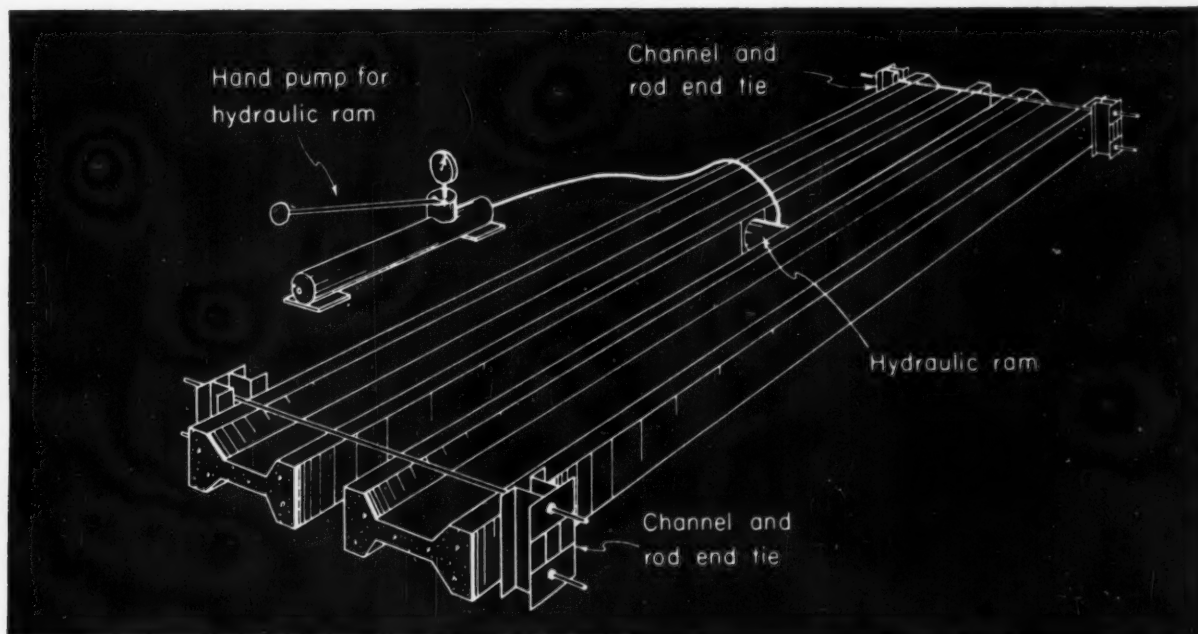
Now for the deflection measurements. Nearly all codes require the design load to be sustained within a specified deflection. Don't worry about complicated deflection measuring rigs with expensive dial gages.

An ordinary surveyor's level and rod will do the trick quite well. Attach one or a series of machinist's rules graduated to hundredths of an inch securely to the level rod. Level readings to this accuracy will be quite adequate.

No matter how solid the supporting members appear, be certain to take deflection readings on both supports and the member. Even the most massive supports will settle a little under the applied load, and this settlement should be subtracted from the member's deflection. Without this support settlement measurement, your structural member might appear to fail the test when, actually, it might be quite adequate.

#### Another Method

Here's a variation that may simplify your test setup. Place two of the members back-to-back on a smooth, firm base. Set the hydraulic ram between the two. Securely anchor the ends of the two members together to withstand the test load reaction. You will expend two of your structural members by this method, but you save the trouble of installing soil anchors, and you simplify the problem of supporting the test members.



# "We carry up to 2,500 lb. more FORD Tandems and still outrun



**SAYS HARRY R. KUNZ  
PRESIDENT, KUNZ PAVING CO.  
SAN MATEO, CALIFORNIA**

Mr. Harry R. Kunz, a Registered Public Accountant in the construction field for 20 years, started the Kunz Paving Company in 1954. He and his two sons, Harry Jr. and Gerald, expect to do \$500,000 worth of work with their fleet of 16 Ford Trucks this year. Here is what he has to say about these trucks.

"Our experience with Fords has proved them to be the best all-around truck we can buy! They haul more payload, cut down considerably on trip time and cost less to operate and maintain.

"The lighter chassis weight of the Ford Tandems lets us carry as much as 2,500 pounds more than competitive makes. This extra payload means that we can haul as much in ten trips as the others do in eleven. Our Fords will beat them on a trip-for-trip basis, too!

"On a 30-mile haul, our '59 T-800 equipped with Transmatic Drive will lap other trucks on the same job every fourth trip. This not only reduces our hauling costs but it makes our Ford's more attractive as rental units for other contractors. One of our associates had two of his trucks and two of our Fords working on the

same job. He actually paid for the rental of our trucks by the extra trips they made.

"Our cost records, set up on an hourly basis to make it easier to prepare bids, show that the longer life built into Ford Trucks makes them less costly to operate. We have one '56 Ford T-750 with over 100,000 miles on it that we use as a base for our tandem hauling costs. In spite of its high mileage — gas, oil, tires, maintenance and repairs amount to only \$2.08 per hour. Facts and figures like these keep us sold on Ford Trucks for our business."



## FORD TRUCKS



# payload on our other trucks on the same job!"

## *Again in '60...* **FORD PICKUPS** **beat all leading makes in Gasoline Economy!**

**Ford Six delivers 13.1% better gas mileage** in second running of Economy Showdown U.S.A.\* Standard 1960  $\frac{1}{2}$ -ton pickups of the five leading makes were purchased from dealers just as you would and run both empty and

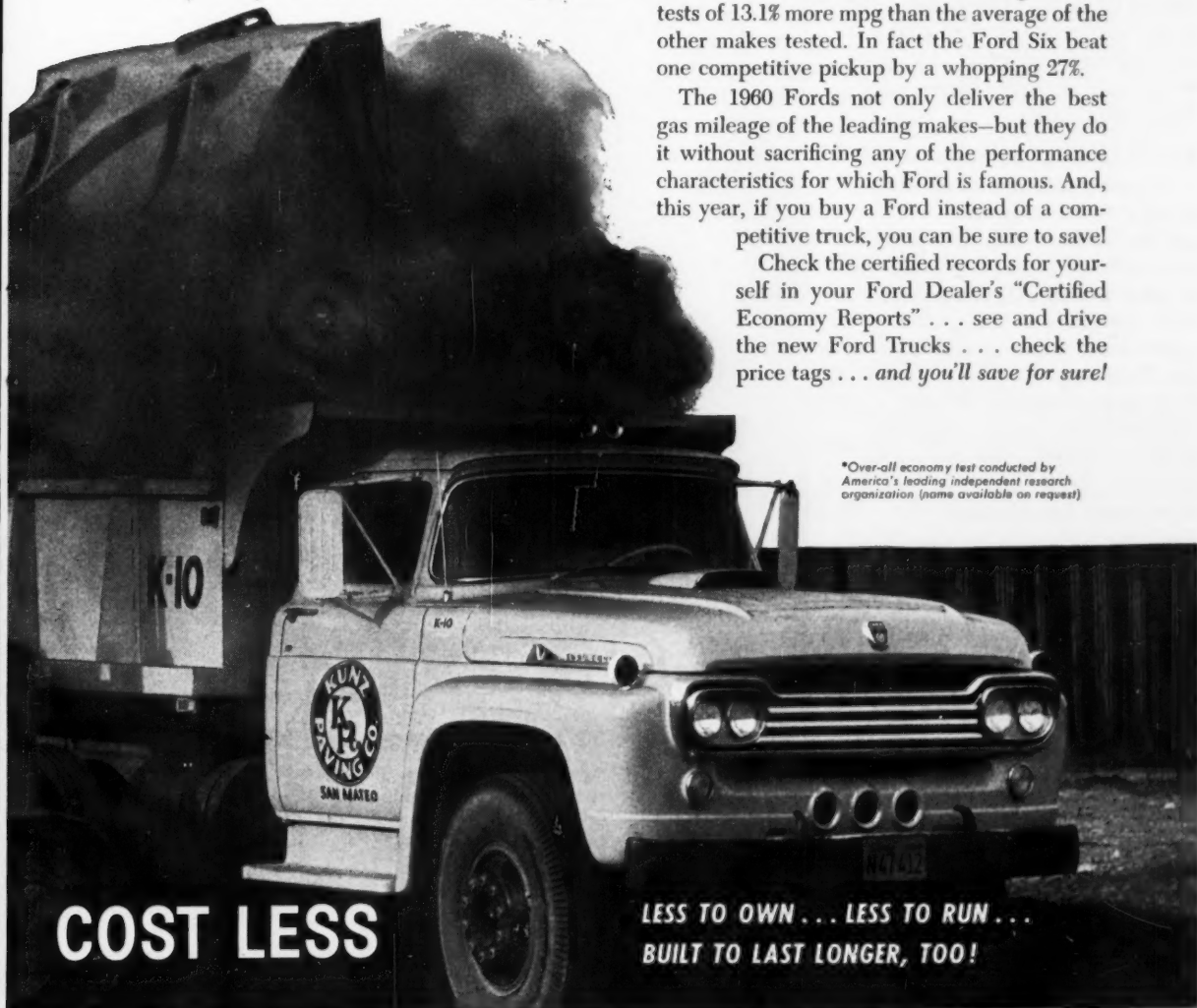
loaded, over flat terrain and hills, at low and high speeds, under city traffic and retail delivery conditions.

Certified results show the Ford Six won *every* test—with a combined Ford advantage for all tests of 13.1% more mpg than the average of the other makes tested. In fact the Ford Six beat one competitive pickup by a whopping 27%.

The 1960 Fords not only deliver the best gas mileage of the leading makes—but they do it without sacrificing any of the performance characteristics for which Ford is famous. And, this year, if you buy a Ford instead of a competitive truck, you can be sure to save!

Check the certified records for yourself in your Ford Dealer's "Certified Economy Reports" . . . see and drive the new Ford Trucks . . . check the price tags . . . and you'll save for sure!

\*Over-all economy test conducted by America's leading independent research organization (name available on request)



### **COST LESS**

**LESS TO OWN . . . LESS TO RUN . . .  
BUILT TO LAST LONGER, TOO!**



## new equipment review

Looking for new ways to get lower costs, *more profit* on your excavating, loading, erecting, off-road hauling, or paving operations? Then take another look at the new machines and methods reviewed here. These are only a few of the many new sizes and types of equipment recently added to the bigger-than-ever Koehring® line.

Long identified with heavy-duty equipment design *and quality*, Koehring has *doubled* its line in these last few years through a concentrated program of new product development. This program is being continued. So, *keep your eye on Koehring* for new opportunities to cut construction costs . . . and get *more work capacity* . . . earn *more profit* per dollar of equipment investment! For up-to-the-minute facts and figures, your Koehring distributor is the man to see. *Why not call him today?*

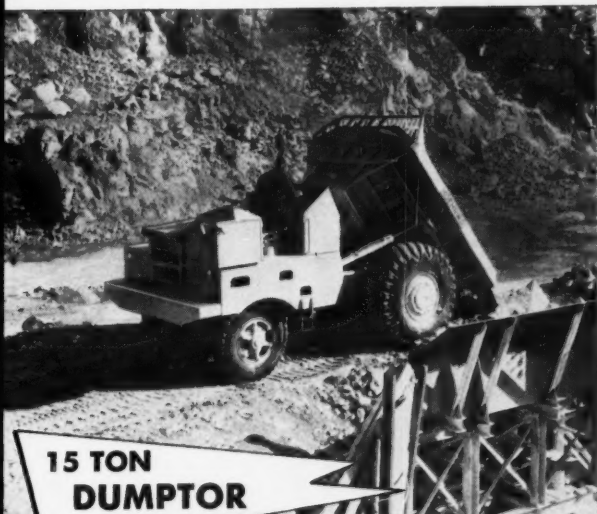
**KOEHRING**  
DIVISION OF KOEHRING CO.,  
Milwaukee 16, Wis.

In Canada:  
KOEHRING-WATEROUS LTD.,  
Brantford, Ontario

### 30-TON 330

30 to 120-ft. boom . . . 150 ft. with jib

Here's extra capacity, extra reach you can use with complete safety. Boom-angle indicator and operator reference guide show max. safe load capacity at every boom length and angle. High-strength pin-pad connected boom permits "2-man" boom-length changes. Power-lowered A-frame removes counterweight. Boom, outriggers also removable for roading. The 330 increases Koehring line on rubber to 8 models: 15, 25, 30, 35, 45, 55-ton truck cranes and 15, 25-ton Cruiser® cranes.



## 15 TON DUMPTOR

### has pivoting seat . . . 2-way controls

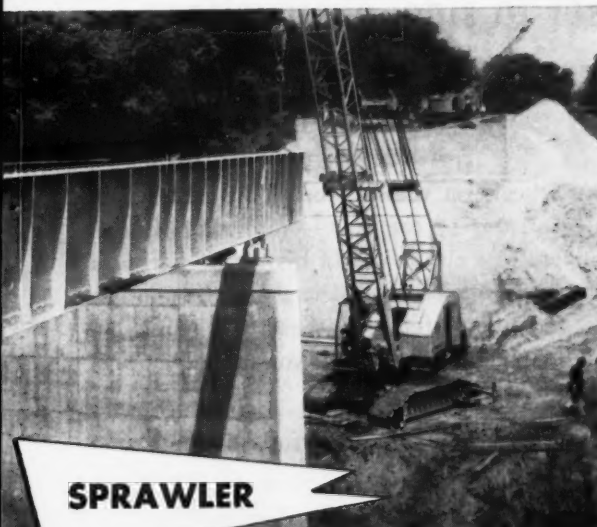
No-turn shuttle hauling is more efficient than ever! Big, new 15 ton Koehring Dumptor® brings you 30,000 lb. payload capacity . . . 24 m.p.h. speeds in both directions . . . plus 2 sets of controls at pivoting seat. Operator always faces direction of travel. There's power steering . . . constant-mesh transmission . . . hydraulic speed-range clutches . . . torque-converter drive . . . Instant gravity-dump, or controlled-gravity with hydraulic cylinders. A Koehring 8 ton Dumptor is available, too.



## SKOOPER

### revolutionizes digging . . . loading

Full-revolving, free-swinging Koehring SKOOPER® digs, hoists, swings, dumps . . . then swings back to digging position without traveling. Twin hydraulic rams crowd the 2-yard bucket along smooth 7-foot level cut from "stand-still" position . . . or cut at any angle of bank slope. Eliminates high track or tire maintenance of conventional drive-in, back-out, skid-turn loaders. 3 types interchangeable buckets: rock . . . re-handling . . . and general-purpose. Excavator-crane convertibility.



## SPRAWLER

### outlifts its own weight by 14%

With pivoting outriggers sprawled into position, 545 SPRAWLER® lifts up to 90,000 lbs. (Weights approx. 79,000 lbs.) Raise pedestals for ground clearance, or remove pedestals and swing outriggers against crawlers . . . and the 545 walks with 61,500-lb. load! Has 40 to 120-ft. pin-pad connected boom (with angle indicator) . . . max. 150-ft. boom-and-jib. Strips for transport to approx. 47,500 lbs. with crawlers intact. 8 other Koehring crawler models: 10 to 95 tons (½ to 3-yards.)



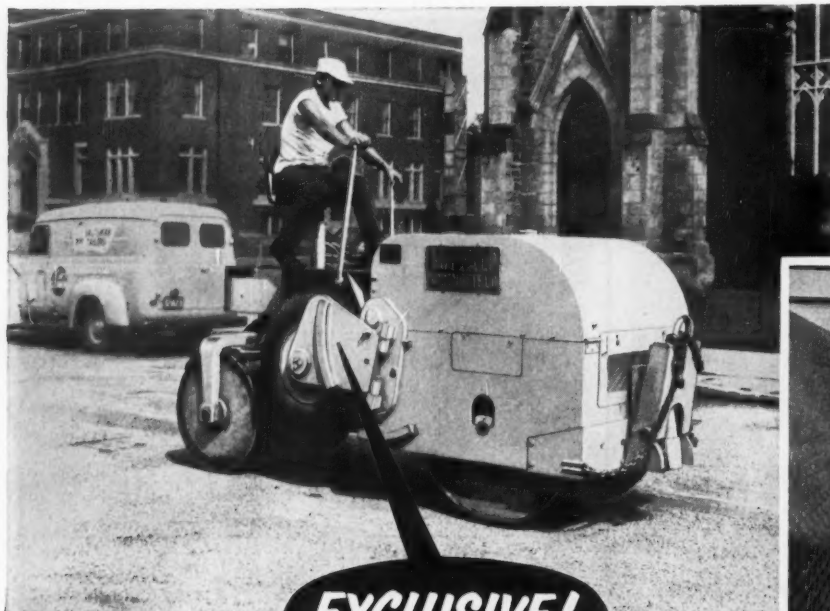
## 34-E TRIBATCH

### paves half mile of highway a day

That's right! 2,580 lineal feet of 24-foot-wide, 9-inch-thick concrete pavement can now be laid in a 10-hour day with one 34-E paver — the new Koehring 3-compartment TRIBATCH! You get 43% more output than with dual-drum 34-E — and with no change in your present batching, hauling, finishing equipment. Secret of high TRIBATCH output is in the continuous production of 3-compartment drum, which produces approx. 2 batches (74.8 cu. ft.) every minute.

K36



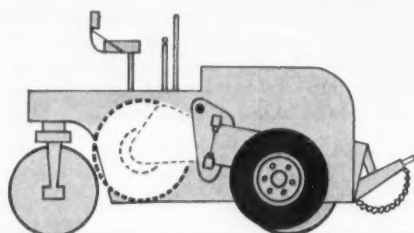


In Galt, Ontario, busy Buffalo-Springfield KT-8 works and runs on fast schedule. Towing wheels, hitch, remain intact — an important time-saver on scattered job assignments around town.

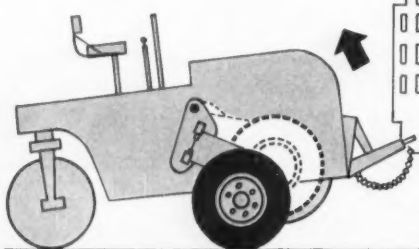
Head-on view shows how fold-away wheels let Buffalo-Springfield KT-8 roll within inches of side-obstructions . . . reduce or eliminate hand-lamping.



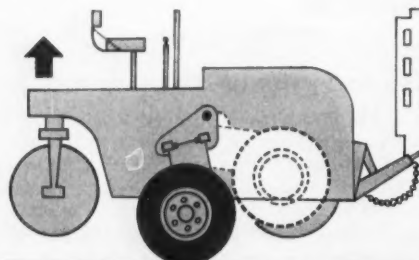
**EXCLUSIVE!**



To make change from work position to travel position, hinged towing wheels swing forward . . .



Hydraulic power applies down-pressure on wheels . . . lifts front-end to height of truck-hitch . . .



After hitch is secured, more down-pressure is applied till balance point is reached. That's all there is to it!

## fold-away towing wheels on KT-8 roller let you work closer to side-obstructions... make faster job-to-job moves

Towing wheels on the 4-6 ton KT-8 roller *fold away* — and *out of the way* — into main frame. Gives operator a clear view of his work. Lets him roll within *inches* of abutments, poles, buildings, fences . . . without removing towing wheels. No other roller on the market offers you this advantage.

Raising and lowering action is hydraulically powered . . . eliminates need for blocking, and jacking. You switch from rolling to towing in a matter of *minutes*. Saves time, effort. Safer, too!

Learn more about this compact little workhorse. Write for tell-all specifications, or call Buffalo-Springfield® distributor.

83



**BUFFALO-SPRINGFIELD COMPANY**

SPRINGFIELD, OHIO

(Division of Koehring Co.)

Also: FLARETTY SPREADERS, SWEEPERS • STARDRILL-KEYSTONE DRILLING MACHINES





## World's biggest Hydra-Boom jumbo drives **OXBOW TUNNELS**

*19 Hydra-Boom mounted I-R drifters  
on five-level air-driven jumbo,  
drill twin 42-ft bores for  
200,000 kw hydro station*

Shown above being moved up to the working area with an assist from four tractors, is the largest tunnel jumbo ever built—taller than a four story building and carrying the concentrated “fire power” of 19 Ingersoll-Rand D-45 drifters on 10-ft chain feeds with I-R Hydra-Boom mountings. Designed and built by Morrison-Knudsen Company, Inc., this huge jumbo was used to drive the twin 42-ft horseshoe power tunnels that will supply Idaho Power Company's 200,000-kw hydro-electric station on the Oxbow bend of the Snake River.

The Hydra-Boom mountings permit rapid hydraulic positioning of all drills from convenient central-

ized controls at each drilling station. Drilling 2½” holes 10 ft deep with modified Vee pattern in the hard, chunky columnar basalt of the area, the jumbo was moved alternately from one bore to the other—drilling in one while the other was blasted and mucked. The crawler-mounted jumbo is self-propelled in the working area by 25-hp I-R air motors.

Air power for the tunnel jumbo was supplied by a bank of six skid-mounted I-R electric-driven XLE compressors with a total capacity of about 8000 cfm at 100 psig—shown at upper right in the photo above.

Whenever you want fast, effortless drill positioning on any job, be sure to check the advantages of I-R Hydra-Boom mountings. Your Ingersoll-Rand engineer will be glad to give you complete information.

**Ingersoll-Rand**  
102AS 11 Broadway, New York 4, N.Y.



A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK.

# GET REAL PRODUCTIVITY



Ask Nick Pinello what he likes about the "Jimmy" Diesels in his earthmovers and he'll tell you "consistently more 'on-the-job' time." And that's just one reason why he picks GM Diesels when he's picking power.

For he'll also tell you his Tournapulls and "Twin C" pusher have racked up as much as 5,500 hours with "scarcely a day in the shop" and no major overhaul. That record is one reason Nick says this about engine parts,

"We haven't begun to stock them."

And it's a big reason why Pinello Construction is making such good time on the 1,700,000-yard grading job they're handling outside Colorado Springs. With equipment spending more time on the job—less time in the shop—the dirt's bound to move... fast.

This Colorado Springs company currently operates two "B" Tournapulls powered by turbocharged 6-110

"Jimmys," three "C" Tournapulls with "6-71's" and the "Twin C" pusher with two "6-71's." The units have given up to three and a half years' service.

Get GM Diesels in your equipment and you'll have units that spend more time on the job—make more money from the job. Proof? See your GM Diesel distributor—he's in the Yellow Pages under "Engines, Diesel"—or mail the postcard for full information.

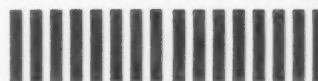
## GM DIESEL ALL-PURPOSE



First Class  
Permit 10,688

**PAID**

Section 34.9  
PL & R,  
Detroit, Mich.



**BUSINESS REPLY CARD**

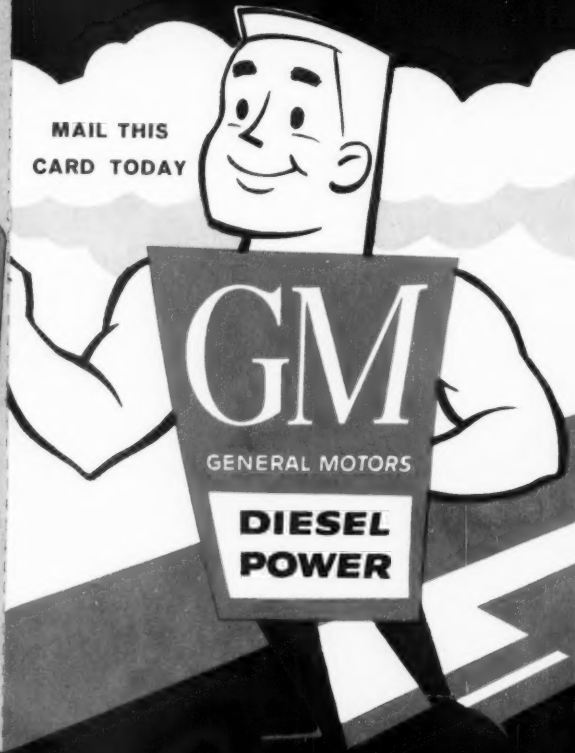
5¢ POSTAGE WILL BE PAID BY

**GM DIESEL**

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Detroit 28, Michigan

Dept. CME-2

MAIL THIS  
CARD TODAY

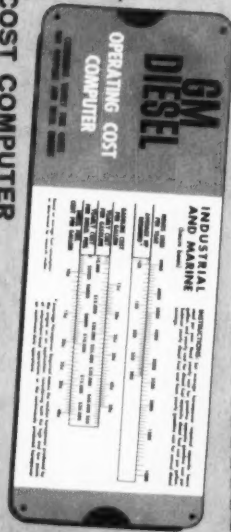


**FREE!**

**DIESEL VS.  
GASOLINE  
OPERATING COST COMPUTER**

Makes it easy to figure the savings you'll make by switching to GM Diesels in trucks, shovels, compressors and other equipment you use.

Please send me my GM Diesel Operating Cost Computer:



NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

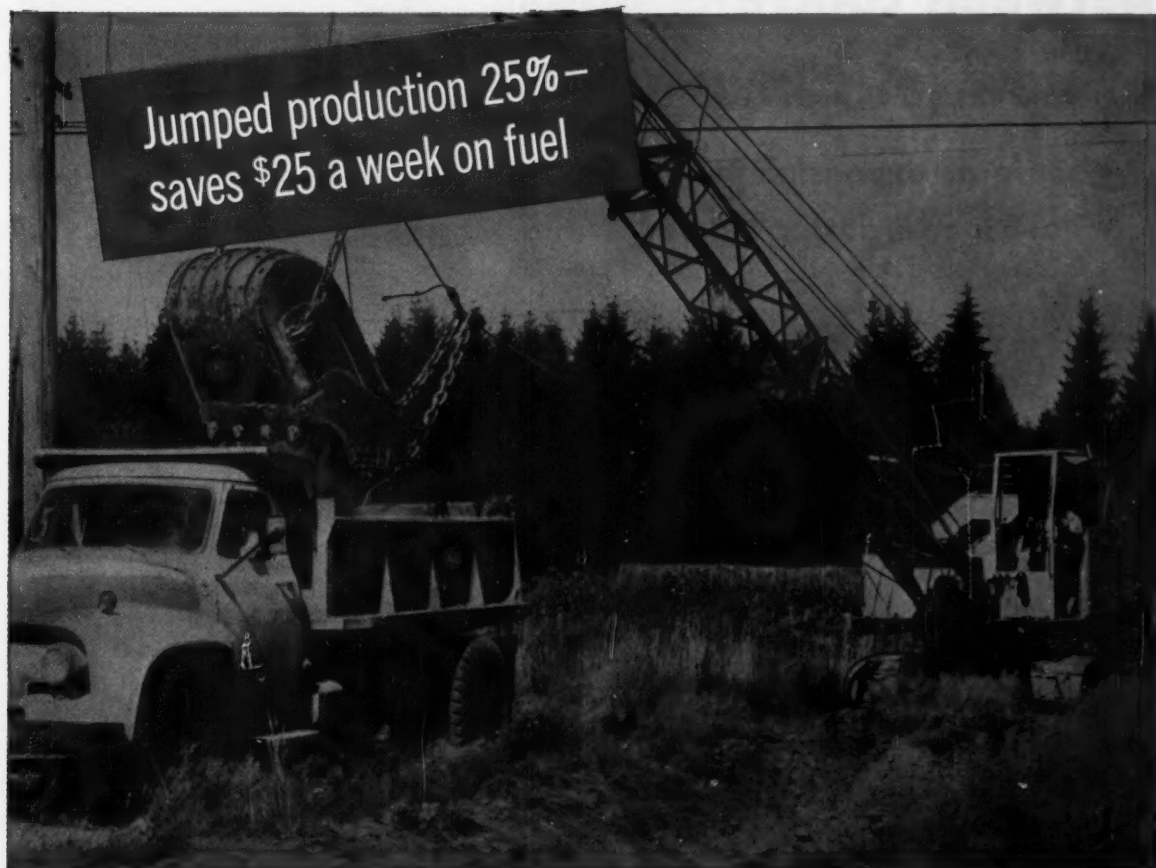
CITY \_\_\_\_\_

ZONE \_\_\_\_\_

STATE \_\_\_\_\_



# GET A GM DIESEL ENGINE



Got a gasoline engine in your excavator? Want to save big money and boost production at the same time?

Then take a tip from Chehalis, Washington, contractors Beuter & O'Neil—they replaced the gasoline engine in their Lorain TL-25 with a 4-53 "Jimmy" Diesel.

They're saving \$5.10 a day in fuel—getting 25% more work per shift. What's more, the "Jimmy" has ended engine stalling on the job—has "lots of guts" according to the operator,

who says he "can't kill it on idle."

And Beuter & O'Neil also say, "We like particularly the fact that the shovel can now pick up heavy stuff at an idle—it doesn't tear the bucket apart. Open throttle with the previous gas engine raised cain with the machine. Now we can hook out rip-rap at an idle—something we couldn't do with the other engine."

With savings and performance like that, Beuter & O'Neil figure their GM Diesel will pay for itself in less

than a year—a bargain any way you figure it. You may do the same thing if you repower with a "Jimmy." Proof? See your GM Diesel distributor—he's in the Yellow Pages under "Engines, Diesel"—or mail the postcard for your GM Diesel Operating Cost Computer today.

## POWER LINE

sets the  
standard of  
Diesel  
productivity



## GM DIESEL

DETROIT DIESEL ENGINE DIVISION,  
GENERAL MOTORS, DETROIT 26, MICH.

In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario  
Parts and Service Worldwide

# Bethlehem dowel units between concrete slabs of new jet runways

- serve as expansion joints
- ease load-transfer between slabs



*Bethlehem dowel units act as expansion joints and help transfer loads between slabs. Easily installed, with no delay to fast pouring schedules, these dowel units nest compactly for ease in shipping and storing at the job site.*

Under construction at Lemoore, Calif., is a new Naval Air Station, to serve as a master jet base for fleet units in the San Francisco Bay Area. Comprising nearly 31,000 acres, with two 13,500-ft-long paved runways, the facility is expected to be operational in mid-1961.

Bethlehem dowel units (type 4) were installed every 225 ft in the runways to act as expansion joints and to facilitate load transfer between slabs. Runways are 200 ft wide, 12 in. thick. After installation of the dowel units, a jet-fuel-resistant sealer was used as a filler.

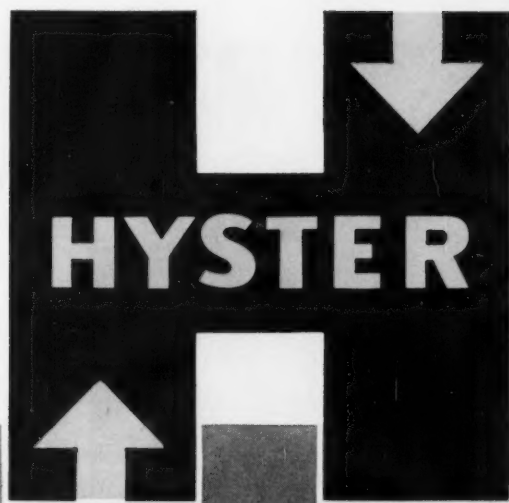
Griffith Company, Los Angeles contractors, paved the airfield, under the direction of the Bureau of Yards and Docks, U. S. Navy.

BETHLEHEM STEEL COMPANY  
BETHLEHEM, PA.

*Export Distributor:*  
Bethlehem Steel Export Corporation

## BETHLEHEM STEEL





**New compaction economy —**

**HYSTER® has it!**

Hyster DW20A Compactors speed up the whole job. You get compaction at over 1,000 cubic yards per hour—at a cost of less than 3c per cubic yard—and maximum production from your scraper fleet.

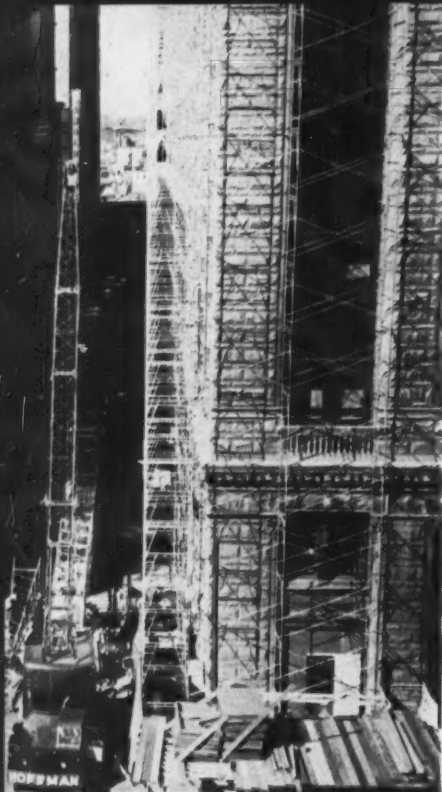
Ask your Caterpillar-Hyster dealer for a demonstration on your job.

*Cat and Caterpillar are registered trademarks of Caterpillar Tractor Co.*

TRACTOR EQUIPMENT DIVISION—Construction and logging equipment  
INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers  
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers  
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service  
Factories: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill. •  
Nijmegen, The Netherlands • Glasgow, Scotland • Sao Paulo, Brazil • Sydney, Australia (Licensee)

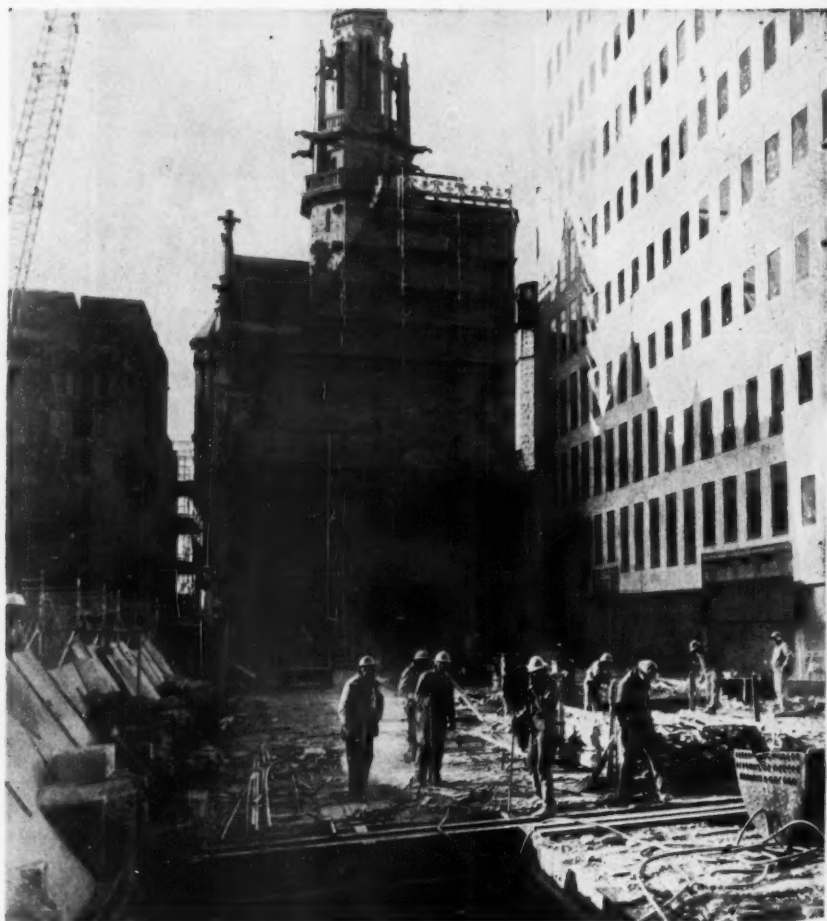


**HYSTER COMPANY**  
TRACTOR EQUIPMENT DIVISION  
P. O. Box 328 • Peoria, Illinois



**ASSEMBLING THE CRANE**—Dismantled tower crane arrives at job site where truck crane erects its tower sections and jib.

**DISMANTLING THE BUILDING**—Wrecking crews break up the structure with air tools and stack the materials so the tower crane can remove them from the floor.



## Demolition—A New Job

**THE FIRST** tower crane to handle a demolition job in the U.S. is working in Newark, N. J.

The work is part of a \$20-million, four-stage reconstruction and development program for the Prudential Insurance Co. The Cleveland Wrecking Co. of Cincinnati, Ohio, is the demolition contractor. They brought a Pecco crane in from Chicago last fall and assembled it at the Prudential site.

The transportation expense was justified because the crane will work on two different buildings, but it will not have to be dismantled for moving between the jobs. The buildings are in the same block across the street from each other.

At present, the crane is working on a massive 14-story stone building that is 185 ft high at

the peak of the roof. Vermilya-Brown Co., Inc., of New York City will erect a seven-story addition to Prudential's offices on that site. Later, the same crane will demolish the 12-story structure at the other side of the same block.

The crane handles materials only. Wrecking crews averaging about 100 men break up the structure with air tools powered by two 600-cfm Worthington rotary compressors. This procedure is followed because the stone can be removed undamaged and can be resold.

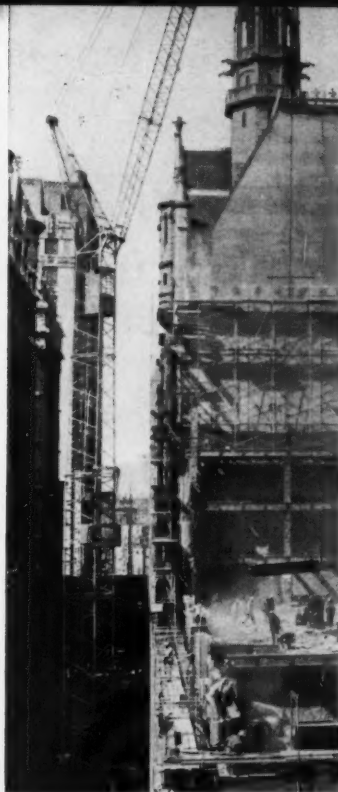
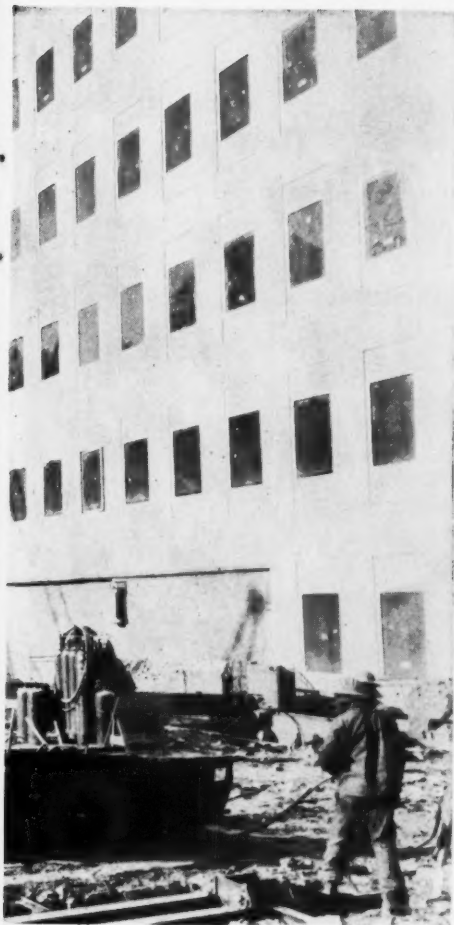
Cleveland Wrecking Co. operates more than 300 pieces of construction equipment, but this is the only tower crane the company owns. The crane operates on rails that are spaced 14½ ft apart and must be perfectly

level. Laying the rails on this job required special care because one end of the block is 16 in. below the other.

The Prudential offices are located in downtown Newark where lack of working space and traffic are problems. The crane operates in a width only slightly greater than the track spacing, and Cleveland is able to keep their operations going with only one traffic lane closed.

Above the crane's tracks is a 115-ft main tower with a 103-ft jib. Three ballast boxes filled with 26 tons of wet sand and gravel help stabilize the crane. It can reach to any part of the building being demolished, and it can pick up materials from the working area and load them into trucks in one operation. This keeps materials handling to

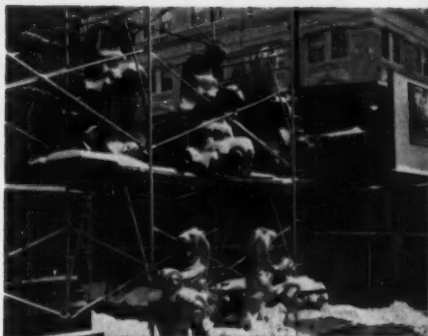




**REMOVING SALVAGE**—Tower crane picks up materials from the working area and lowers them directly into trucks.



**WORK PLATFORM**—Access to outside of wall helps remove ornaments undamaged.



**VALUABLE SALVAGE**—Some of the decorative stone gargoyles sold for \$500.

## for Tower Cranes

a minimum and speeds up the entire job.

Push-button control panels operate the crane from four different locations. Three of the panels are at the top, middle, and bottom of the main tower; the fourth is suspended from a cable to permit remote control from any spot on or near the building.

Electric motors power all crane operations. A 60-hp motor handles hoisting, a 25-hp motor raises and lowers the boom, a 6-hp motor swings and two 12.2-hp motors power the wheels on either side of the crane. The rig requires 440-v dc current.

In addition to the crane, the only other materials handling equipment is three small Hough Payloaders. Two of them work inside the building pushing

debris down stairways and other openings to the floor below. The third Payloader works on the street loading debris and clearing the crane's tracks.

Elliot D. Stern, project manager for Cleveland Wrecking Co., says the crane is efficient if job conditions are right. Dismantling and moving the crane from job to job is costly.

If a building is only four or five stories high and space is not a problem, crawler or truck cranes are likely to be the best bet. But Stern says Cleveland will continue to use this crane on demolition of tall buildings, especially in congested areas.

Doing two jobs in the same location is an additional factor that makes the Newark job suitable for tower crane operation. When demolition on Prudential's

Stage 3 is completed, Cleveland Wrecking will move on to the Stage 4 site, another building about 100 ft up the block and across the street from the present job. It will not be necessary to dismantle the crane to move it to this site—the track will be picked up at one end of the block and reinstalled at the other end.

The demolition contract is based on a fixed price in addition to which the wrecking company keeps all salvage. According to Cleveland, they are able to sell everything but the dust.

Some of the salvage from the Prudential buildings are gargoyles. Extra care is necessary in removing them to avoid damage. But the special care in dismantling the gargoyles and decorative cornices, windows, and doors has paid off because all of them have been sold—some to buyers as far away as Hollywood, Calif.



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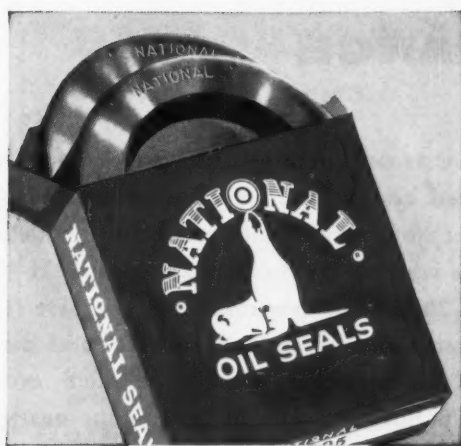
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**SHOVELS:  $\frac{1}{2}$  to  $\frac{3}{4}$  YDS. • HOES:  $\frac{1}{2}$  to  $\frac{3}{4}$  YDS. • CRANES: 5½ to 40 TONS • DRAGLINES:  $\frac{1}{2}$  to  $\frac{3}{4}$  YDS.**

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**Series B  
Model H-70  
Model H-90**

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NEW  
but...**



**Series "B" H-70 PAYLOADER**

**with numerous improvements that  
give INCREASED PRODUCTION  
and BETTER PERFORMANCE**

"PAYLOADER" leadership over the years is based on superior design, construction and performance of each Model. And "PAYLOADER" leadership is maintained through a policy of progressive engineering. Engineering and research staffs are continually developing and testing new materials, methods, and designs, all directed to improve "PAYLOADER" performance in terms of serviceability and increased output.

As soon as new developments are thoroughly perfected and proved in fleets of test units, they are incorporated into production models. That is why we say the Series B Models H-90 and H-70 are not new machines, but have incorporated into them many new features and design improvements that make them even better performers than before. Your nearby HOUGH distributor is eager to prove it.



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### *Model H-90 Series B*

**CAPACITY:** Operating . . . . 9,000 lbs.  
Peak Lift . . . . 18,000 lbs.

**NEW ENGINE:** New, powerful Cummins Turbo-charged diesel engine develops 162 hp at 2,100 rpm. GMC Diesel is optional—develops 153 hp at 2,200 rpm.

**MORE STABILITY:** Wheelbase is extended and wheel tread is widened which, along with greater machine weight, greatly increases the balance and stability of the machine for ANY working condition.

**MORE TRACTION AND FLOTATION:** Standard tire size is increased to 18:00 x 25, insuring more traction and flotation whenever they are needed.

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## **PAYLOADER®**

### *Model H-70 Series B*

**CAPACITY:** Operating . . . . 7,000 lbs.  
Peak Lift . . . . 13,000 lbs.

**MORE POWER:** Available with a larger diesel engine (Cummins 124 hp). Also available with IHC gasoline engine of 110 hp, and GMC diesel engine of 105 hp.

**MORE LIFTING POWER:** Improvements in the boom arm design and bucket control linkage provide more digging power especially for digging below grade.

**HYDRAULIC RESERVOIR:** The capacity has been increased to gain greater efficiency for the operation of the many hydraulically-actuated allied accessories that are available, such as: 4-in-1 bucket; side boom; back-hoe.



### Series "B" H-90 PAYLOADER

**NEW LITERATURE** is available without obligation on the Series B Models H-70 and H-90, also, an illustrated folder showing all 10 "PAYLOADER" models and the many useful attachments for each.



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### **THE FRANK G. HOUGH CO.**

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- ☐ Data on Series B model H-90
- ☐ Complete "PAYLOADER" line and all attachments

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Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

4-B-1



**Geared with Fuller ROADRANGER . . .** Three International Model 495 Pyscrapers belonging to V. H. & M. Construction Co., Denham Springs, La., handle a total of 4500 to 5000 cu. yds. of material every 10½ hrs. in construction of Interstate Highway I-10 between Jennings and Egan, La.

## Faster work cycles boost profits... COUNTERSHAFT BRAKE SPEEDS UPSHIFTS

### Longer gear and bearing life with Pressure Filtration and Lubrication

Heavy rainfall and deeply-rutted, wet blue-clay surface have been major obstacles to the work of V. H. & M. Construction Company on a Louisiana highway project. Fighting weather, time and terrain, V. H. & M. handles a total of 4500 to 5000 cu. yds. every 10½ hours with 3 International Model 495 Pyscrapers equipped with semi-automatic 9-

speed Fuller R-1160 ROADRANGER Transmissions. Standard equipment on the R-1160 includes the Fuller Air-Powered Countershaft Brake and Pressure Lubrication and Oil Filtration System.

E. D. Pinkston, Superintendent, says, "Thanks to our Fuller-equipped Pyscrapers, our production is very good despite miserable operating con-

ditions and material which is extremely tough to handle. Our operators like the Fuller countershaft brake. It gives quick, easy upshifts without double clutching, keeps speeds up and cuts cycle time. And the pressure lubrication and filtration system prolongs gear and bearing life."

Ask your dealer about the off-highway Fuller Transmission . . . with countershaft brake and pressure filtration system as standard equipment . . . designed to put more profit in *your* operation.

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## CONCRETE NEWS LETTER

### Nashville Contractor Picks G-46B Roto-Trowel for the Big Jobs

Clarence Schaub Construction Co., Nashville, Tennessee needed a giant-size troweling machine to finish the concrete floor of a new big-volume warehouse.

On the recommendation of local distributor Wilson, Weesner & Wilkinson, Inc., Schaub Construction chose the Stow G-46B Roto-Trowel. On-the-job performance of this trowel quickly proved its superiority in speed and handling ease. Schaub's Job Superintendent and Trowel Operator both said of the G-46B . . . "Easiest handling trowel we've ever used and we get the best finish possible!"

With four trowel blades, and that big 46" diameter, the G-46B powered by 6.8 HP engine cuts finishing time way down, finishes faster by far! Put a G-46B to work on your large-area concrete finishing jobs. Your men will do better, faster finishing jobs with Stow Trowels. They like Stow's top-quality features: Safety Guard Ring, New Sheave-Type Manual Clutch Control, Convenient Pitch and Throttle Regulators.

Choose the Roto-Trowel you need from Stow's complete line of Trowels, Screeds, Concrete Grinders, Tampers and Vibrators.

### Fuller Construction Standardizes on Stow Roto-Trowels for Concrete Finishing

In a recent interview, Mr. W. V. Fuller, President of the Fuller Construction Co., Greensboro, North Carolina, reported, "Our Stow Roto-Trowels are easier to operate, less costly to maintain and produce better finishes than any of our other troweling machines!"

Mr. Fuller's comments are typical of Stow Roto-Trowel users—and with good reason. Stow's complete line of Roto-Trowels offers a range of sizes to fit every troweling need. Seven models are available in diameters ranging from 29" (G-29), to 46" (G-46B), with appropriate HP ratings of 2.2 HP to 6.8 HP.

Small diameter models are equipped with 3 blades, the large diameter models with 4. Some models possess interchangeability features so that grinding blocks may be used. Stow's heavy-duty, sheave-type clutch is also an optional feature which many contractors find desirable.



Stow G-46B Roto-Trowel in operation on warehouse floor finishing job, Nashville, Tenn. Control ease is demonstrated as operator varies blade pitch with right hand while guiding Roto-Trowel with left hand.



G-34-4C Roto-Trowel finishing garage floor. Handling ease enables operator to trowel up to wall base.

*All the more reason to specify Stow for your own individual requirements. For the full story on Stow's complete line of job-tested Roto-Trowels, Vibrators, Grinders and Screeds, clip the coupon. Stow will send you the facts by return mail.*

**STOW MANUFACTURING CO.**

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Send me Cat. 580 today!

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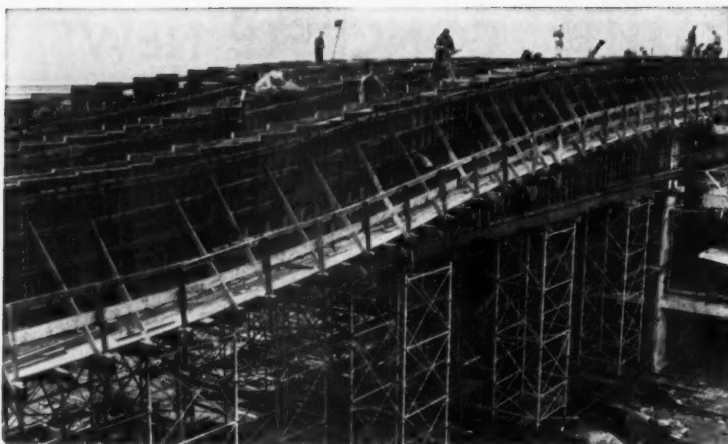
City \_\_\_\_\_ State \_\_\_\_\_



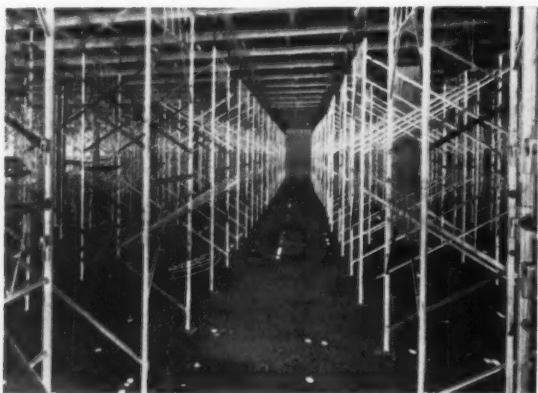
# Shoring Methods

for concrete  
construction

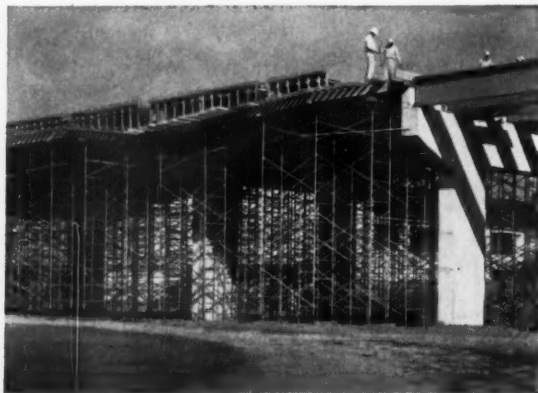
... by Patent  
Scaffolding CO.



**EXTRA HEAVY DUTY SHORING Rolls to Pours**—Mounted on a traveller, each Extra Heavy Duty Shoring set-up supports two of 16 clear-span concrete girders from 7'8" to 8'8" deep, 2' to 2'10" wide, and 125' long, at Eastern Airlines Terminal Bldg., Idlewild Airport, N.Y. Gilbane Building Co., gen. contr., pours a pair of girders, lowers shoring and rolls it to new positions.



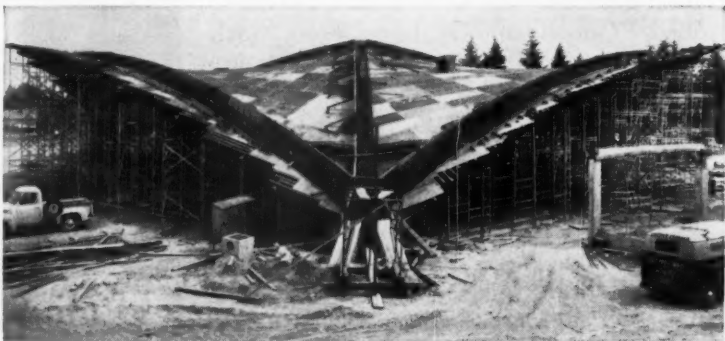
**STANDARD SHORING Meets Most Job Needs**—Standard "Trouble Saver" Shoring 5'-wide frames are assembled rapidly to provide safe, ample support for pan construction of the Atomics International Project, Canoga Park, Calif. Shoring supports 30" x 30" x 14" domes with 4½" slab. C. L. Peck Construction and Realty Co., general contractor.



**NEW HEAVY DUTY SHORING Supports Bridge**—Safe support for the heavy loads imposed by this concrete overpass in San Jose, Calif., is provided by new PS Co. 4'-wide Heavy Duty Shoring frames, tested under simulated field conditions to safely support loads up to 10,000 lbs. on each leg. General contractor, Oscar C. Holmes.

## STANDARD FRAMES SHORE HYPERBOLIC PARABOLOID STRUCTURE—

On the new auditorium for Edward S. Ingraham H. S., Seattle, Sound Construction Co., general contractor, uses 1300 standard "Trouble Saver" Shoring frames to support dome and slab formwork for this concrete hyperbolic paraboloid structure. Design involves three anchors, set 161' apart, from which three center beams, 2'6" x 4", arch to 35' high. Two perimeter beams per anchor fan out and intersect at 28' high.



## THE PATENT SCAFFOLDING CO., Inc.

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Complete scaffolding equipment and engineering service offered through nation-wide sales offices or representatives. Look under Patent Scaffolding in the Yellow Pages for your nearest source.

**SALES**

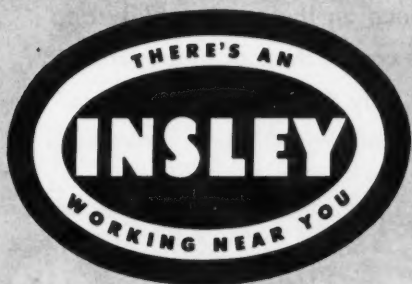
**RENTALS**



# Take a bigger bite with the Insley backhoe

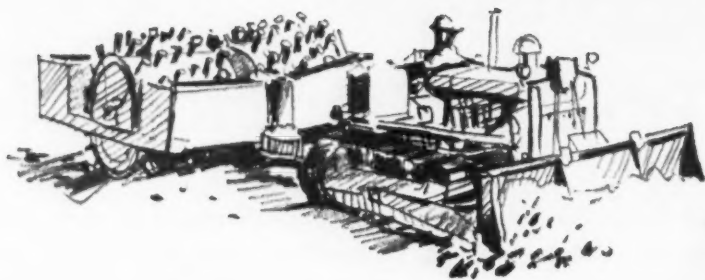
● You can count on the Insley WB excavator to move more earth in any given time. That's because the WB takes a full bite—and more. It's a full  $1\frac{1}{4}$  cu. yd. machine—on paper and on the job . . . and it's "power matched" to capacity for a profitable combination of performance, efficiency and long life. That's why it's a favorite in the industry.

See your Insley distributor and let him show you an Insley WB working in your area. See how the WB meets your requirements, as an excavator, self-propelled crane or truck crane. And get the facts on the complete line of Insley machines—5 to 45 ton crane capacity,  $\frac{1}{2}$  to  $1\frac{1}{2}$  cu. yd. bucket capacity, crawler, self-propelled carrier and truck mountings.



**INSLEY MANUFACTURING CORPORATION**

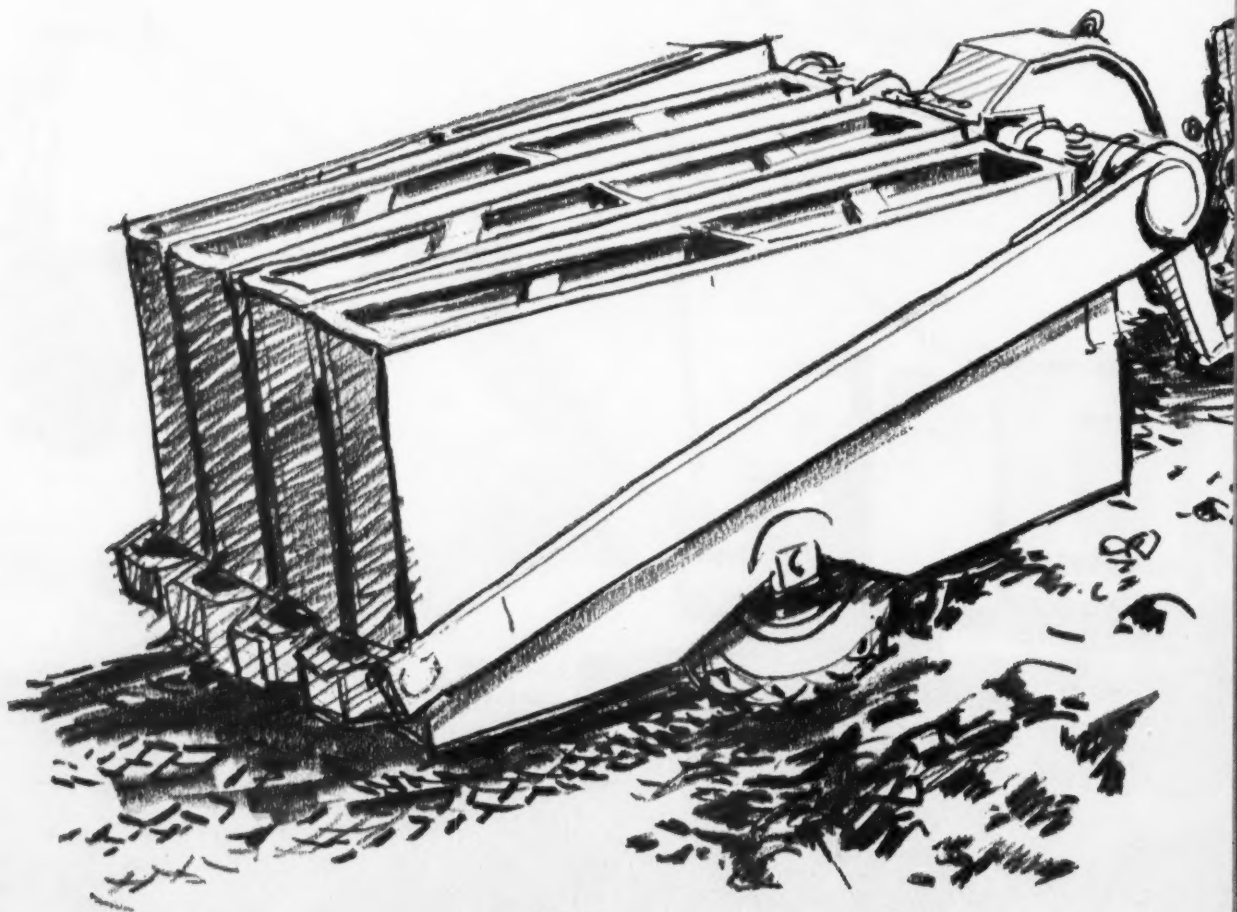
General Offices • Indianapolis 6, Indiana



# EARTH

*"IN THE PROCESS of building a highway, there is no construction activity which has a greater influence on the serviceability and life of the finished facility than the compaction of embankments and such overlying layers . . . as may be used in its design."*

H. A. Radzikowski, Chief, Division of Development, U. S. Bureau of Public Roads.



# COMPACTION

## HOW TO ACHIEVE BETTER RESULTS AT LESS COST

by M. D. MORRIS

**COLLECTIVELY** we pay a national maintenance bill of hundreds of millions of dollars each year to keep up our old road network. Much of this monumental drain on our pocketbooks reflects the sins of past construction.

Improper compaction of subgrades is the basic cause.

The construction contractor of the past was not so much guilty of short-cutting as he was of not really knowing all there was to know about compaction. The supervising agencies were equally at fault in not thoroughly understanding these fundamentals and communicating them to the men on the job.

The answer is simple. Pavement damage from subgrade failures would not occur if all concerned understood much more about what went under the crusts. The economics of embankment construction depends on considerably more than just a nodding acquaintance with heavy equipment operation or soil mechanics. But it is a big piece of both, plus common sense.

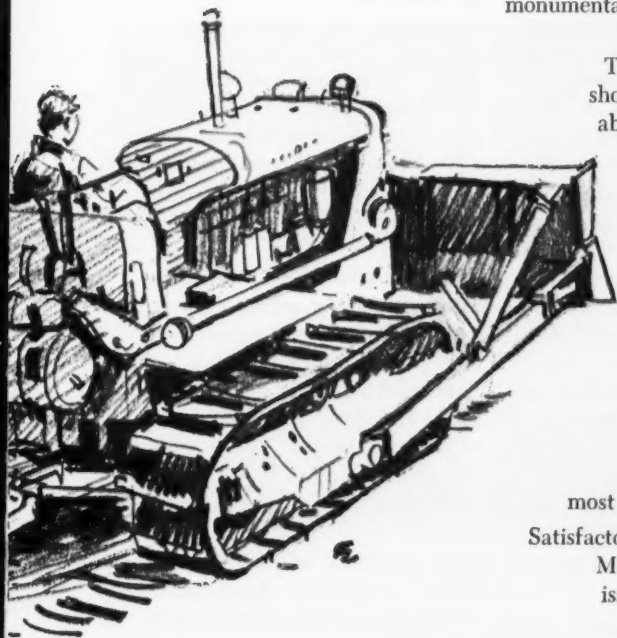
Economy is the dictating factor today. We bother with compaction because we can't afford not to. Embankment stability is our desired objective—stability obtained by the most economical, efficient means that also will insure lasting quality.

Satisfactory compaction is a function of four major component elements: Men, Material, Machines, and Methods. A series of articles in this issue and in succeeding months will cover the four M factors in detail, and includes a glossary on page 234.

(Although this series makes specific references to the construction of highway fills, it does so only for the sake of organization and clarity in a single frame of reference. Everything included is equally applicable to airport subgrades, earthfill dams, and any embankments.)

The first factor is Men. Men write lists of conditions they require for acceptable embankments and, further, list the elements which are undesirable.

These are specifications. Other men must do the actual construction work in accordance with these specifications. And agents of the specification writers see that the constructors adhere to the stipulations. Still other men create devices to accomplish this work and devise means to check the results. So let's begin with **Compaction Specifications** on the next page.



Mr. Morris is a New York civil engineering consultant specializing in soils. After graduation from Cornell University he served with the Corps of Engineers building military installations in the Western Pacific. For several years thereafter he was trouble-shooter on construction jobs, including highways, in Venezuela and the U. S.

## 1. COMPACTION SPECIFICATIONS



IN EMBANKMENT BUILDING, the owning agency wants the most dense and stable earthwork obtainable at the lowest possible price. The contractor strives to achieve the most economical method available in order to meet the minimum standard in the shortest time and thereby make the greatest profit. Owners accuse contractors of cutting corners, looking for loopholes and dodging directives. And the constructor feels the client wants to squeeze out perfection from a pittance while deliberately trying to harass him with restrictions.

This age-old conflict between owner and contractor is inflamed by ambiguities and wordiness in specifications that can be either overtly constraining or vaguely indefinite. "Old maids live by rule and (some) men live by reason." In this setup there is not enough reason among us, too many rules, insufficient trust and honor, and little pride in the finished product.

### What Do We Want?

Most of these differences could be alleviated by an understanding of what is actually desired by all factions. Reasonable specifications, ultimately as uniform as possible for the soil types involved, are basic to the realization of this goal. There is a way to write a specification so that the owner will have satisfaction at a reasonable price and the contractor can complete his work with pride and still make a reasonable profit.

The builder does not want a free hand to do as he will: He should have direction and a target. To operate best, he must be aware of the vast differences in soils, and the large variety of equipment on the market. He needs a guide to help him select the correct machine for the job at hand. His economics are based neither on the inflexible demands for specific equipment, regardless; nor on the "free hand" school. They are based on the narrowest range of equipment that will compact the widest range of soils effectively, knowing no single item will ever do it all.

The idea that specifications are restrictive or non-restrictive is misleading. It is a matter of semantics since, by meaning, every specification is restrictive in some way: It is only a matter of degree. Here is where reason must apply.

### Standard Specifications

There are four basic standard specification types for embankment construction:

- (1) **Method only**
- (2) **Method and end result**
- (3) **Suggested-method and result**
- (4) **End result only.** Sometimes referred to as a performance specification.

These four types of specifications are written after considering such variables as the specific soil at the site, the fill material on hand within economical haul distance, the difference between lab-

oratory and field moisture-density relations, the various types of available equipment for preparing the fill, the height of lifts, and the speed and number of passes of compacting equipment. In its turn, each of these fluctuating elements will be discussed in detail, as will the Proctor test. The meaning of the test and modifications will be described in next month's section on materials—we remain now with four basic specification types.

(1) **The method only** specification is becoming archaic because it describes in detail how compaction is to be accomplished, yet states nothing about results. It is the least satisfactory to both owner and contractor. It may force the contractor to buy or rent equipment he may not have at the moment to use on soils where other apparatus may be more efficient. And it may direct him to use equipment in an uneconomical manner.

Generally, equipment manufacturers do not favor method only specifications because most were written about a decade ago with machines of that era in mind. Costly research programs have led to superior machines that may be more efficient for the job. But often these can not be used where they do not meet existing specifications.

Disadvantage to the owner is that he may not get the best result for his money. He never knows with this type specification.

*continued on page 221*



# 17 ARMCO STEEL BUILDINGS SERVE CONTRACTORS AT THE NIAGARA POWER PROJECT

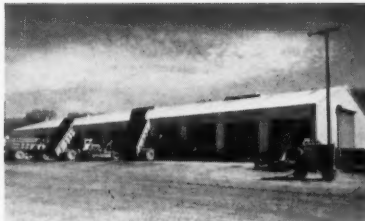


Artist's sketch of completed Niagara Power Plant

New steels are  
born at  
Armco



Main Office Building



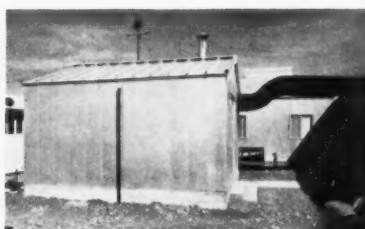
Maintenance Shop



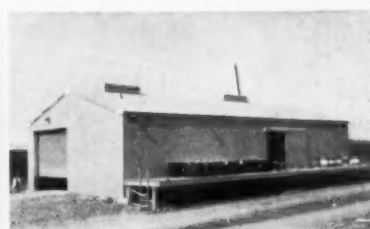
Turbine Parts Warehouse



Shop and Warehouse



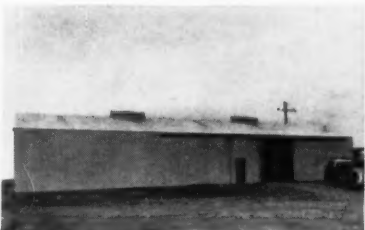
Heating Plant House



Oil and Grease Storage



Compressor House



Tire Service Building



Railroad Maintenance Shop

Armco Steel Buildings, ranging in size from 12 by 16 feet to 100 by 300 feet and totalling 182,486 square feet, serve contractor needs at the gigantic Niagara Power Project of the Power Authority of the State of New York. Some of these are pictured here.

While these are job-site installations, contractors also utilize Armco Steel Buildings for their own permanent offices, shops, and warehouses. Low initial cost is an important factor, but these buildings are also preferred for their appearance and high quality.

Armco Buildings are available in clear-span widths from 5'4" to 100'—with unlimited lengths. For complete information, write for our new 36-page booklet. Armco Drainage & Metal Products, Inc., 6080 Curtis Street, Middletown, Ohio.

## ARMCO DRAINAGE & METAL PRODUCTS

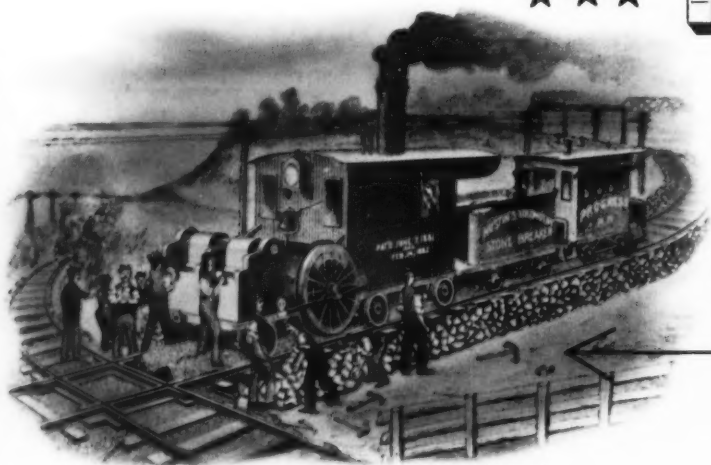


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FOR 1893
 



BETTMANN ARCHIVES

They had plenty of ingenuity in the old days—what they lacked was sharp production tools! This 1893 Locomotive Ballast Crushing Machine could run at 30 miles per hour, and change to a stone breaker in 5 seconds by raising the drive wheels off the track. The two hand-fed crushers could turn out a total of 25 to 30 yards per hour.


 Today....

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**Cedarapids gives you the**

## **SHARPEST PRODUCTION TOOLS**

**to meet the toughest specifications at lowest cost per ton!**

Gone are the days when road rock was merely broken into any old size, and often laid by the farmer to work out his road taxes.

Today, aggregate production is a fine art—roadbuilding is a precise science. To remain competitive you need the most sharply modern equipment design and engineering available. You need the sharp production tools Cedarapids gives you.

Stop a moment and think what it takes to make money in your aggregate producing business today. It takes crushers, screens, feeders, conveyors, washing equipment geared to enormous output—300, 500, 800, 1000 tons or more per hour.

It takes production units that will *meet the toughest specifications in roadbuilding history*. It takes portable plants, like the Commander above, to let you bid on the best jobs that may be hundreds of miles apart, and get you there fast—or stationary plants like the one at the left which are factory engineered by experts to handle your specific local job most productively. And to make money for you, this equipment *must produce at lowest cost per ton*.

Cedarapids equipment does! It gives you the capacity, the specification-meeting ability, and the operating economy you need to meet today's roadbuilding challenge with profit.

**IOWA MANUFACTURING COMPANY • Cedar Rapids, Iowa**



**AGAIN . . . Ford Industrial Engines are selected for outstanding performance and dependability . . .**

## **Versatile Ford-powered Hydrocrane provides 70 feet of lift with its "boardinghouse reach"**

**M**Meet the smooth-working Bucyrus-Erie H-5 Hydrocrane which features a hydraulically telescoping boom that allows you to "inch" 12-ton loads under wires, limbs and through apertures with precision control. Just as Ford power contributes to the effectiveness of the H-5, it can bring a new kind of efficiency to your equipment. Here's why:

**DURABILITY AND ECONOMY . . .** Ford's Short Stroke design and Deep-Block construction cut friction, vibration and wear. Overhead valves permit higher compression ratios, greater power output and make servicing easier, quicker and less costly.

**COMPACTNESS . . .** Thanks to Ford's space-saving design and advanced engineering features, *all Ford engines now develop more power per pound of engine weight than ever before possible.*

### **FORD POWER IS RIGHT FOR YOUR CONSTRUCTION EQUIPMENT, TOO!**

**INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION, FORD MOTOR CO., P.O. BOX 598, DEARBORN, MICH.**

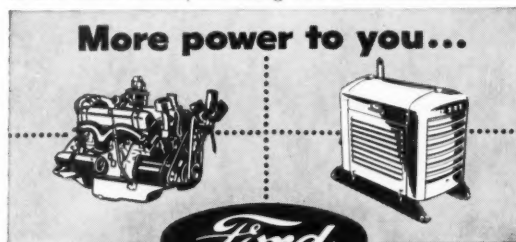
**West of Rockies write to:**

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**PARTS AND SERVICE . . .** With more than 10,000 Ford Dealerships in the U.S. alone, you can get prompt, efficient service *wherever your job takes you.*

So, to keep your profits up . . . your operating costs down, power or repower your construction equipment with a dependable Ford Industrial Engine—available from 134 to 534 cubic inches, including two economical diesels.



**INDUSTRIAL ENGINES  
AND POWER UNITS**



He can only be reassured that the job has been done the way the specs called for.

Today only one state's standard specification has no requirement for percent density in result, but it does specify a method of preparing, spreading, and rolling. And it calls for some specific equipment types.

(2) The method and end result specification is the most restrictive and constraining. It leaves nothing to the contractor's initiative and hobbles his use of experience and research. In some soil types it may be quite difficult to follow the prescribed procedure and still deliver the result required. Conversely, sometimes it is necessary to go to the added expense and inconvenience of creating "special provisions" in the methods in order to come up with the specified end result.

The U. S. Bureau of Reclamation finds the method and end result spec practicable in one situation. In its standard specifications used in the construction of



earth dams, the amount of compactive effort to be applied is specified. The moisture-density relation is defined also.

"When earthwork is concentrated on a large dam, we can specify the amount of compactive effort to be applied and can inspect this work to see that the compactive effort is applied," says Wesley G. Holtz, head of BuRec's earth materials laboratory in Denver.

#### How it Works

Here is one example of what can happen when a method and end result spec is used:

On an airfield job, an end result of 95% Proctor was specified. Also stipulated were 12-in. lifts compacted by a 12-ton steel-wheel roller. The contractor was losing money, and it was difficult to get 95% densities all the way through the lift. The material was such that the dumping and spreading equipment required push tractors to keep them moving in the loose soil.

An experienced consultant reasoned and demonstrated that in this specific case, by building only 3-in. lifts, the dumping vehicles could move right along without the tractor boost, and lighter rolling equipment obtained 97% compaction throughout. This reasonable change made the operation faster, gave a superior end product, and resulted in economy for

all involved. This may not be applicable in every case, but it is reason for reason and cause for thought of what we really want. (3) The suggested-method and end result specification seems the most reasonable arrangement. It allows the more experienced contractor the latitude to make use of his experience, while it offers a guide to the less knowledgeable contractor. At the same time it insures for the owning agency the desired finished product.

Stephen M. Olko, a New York consulting engineer who is a compaction expert, believes that in most cases, "A performance specification is superior to a methods specification. It is important, however, to provide guidance. This permits the contractor to select his own equipment. And it results in more competitive bids at reduced costs, particularly for large projects."

(4) The end result or performance specification is becoming more popular, and there is a trend toward its more frequent use. A typical specification of this type might say: "The contractor may use any type of compaction equipment he deems necessary to obtain the specified density."

In referring to BuRec's earthwork specification for compacting earth canal linings, canal embankments, and other compacted earthwork for miscellaneous structures,

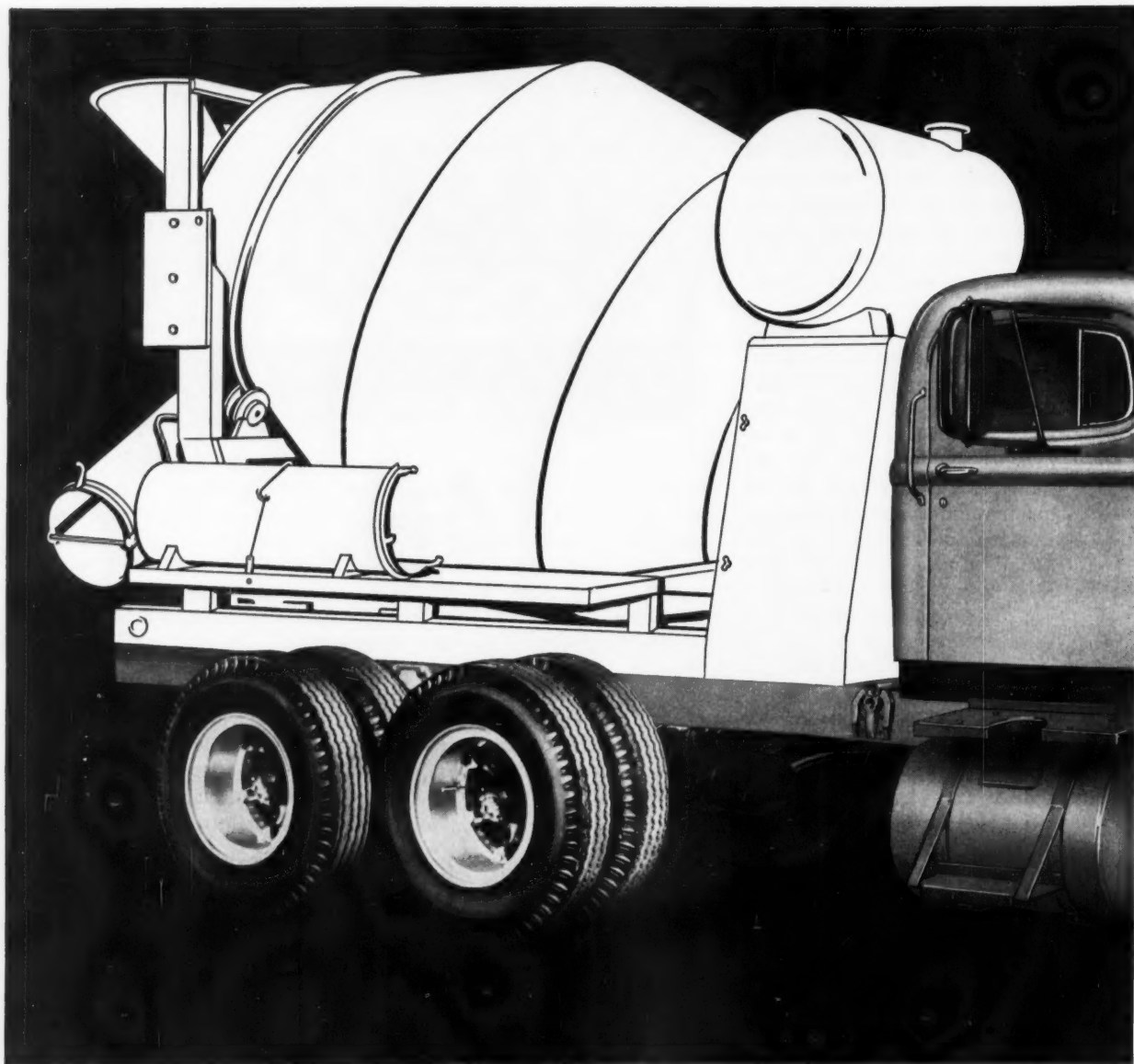
continued on page 224

#### SPECIAL PROVISIONS

Special provisions are just what the name implies. When the standard specifications were drawn up, they were written on as broad and all-inclusive base as possible while still hoping to spell out what was required. Variations in job conditions make some standard specifications impossible to fulfill.

To preclude the shambles that legal and operational exceptions could create, some states carry in their specification books an encyclopedia of special provisions for such possible irregularities. But some cases are difficult to anticipate, hence additional special provisions must be made.

Use of end result or suggested-method and end result specifications would eliminate the necessity for most special provisions.



**In the '60 Showdown...White brings you**

### **New Tandem**

**Model 4264S.** Medium-duty, 37,000-43,000 lbs. GVW. Takes a dump body or a 5- to 6-yard mixer. Heat-treated chrome-manganese-steel frame. WHITE super Mustang valve-in-head 6-cylinder wet sleeve gas engine.

### **New Low Price**

**Lower than ever.** WHITE's many years of specialized experience in engineering and building trucks for the construction field enables them to give you more truck for your money than anyone else in the industry. Bar none.

### **New PTO**

**Belt-driven cog-pulley, flywheel power take-off.** Lightweight (it's 150 pounds lighter than gear-driven PTO). Low initial cost. Proven in transit-mix operation. Has practically no maintenance problems. No lubrication needed.



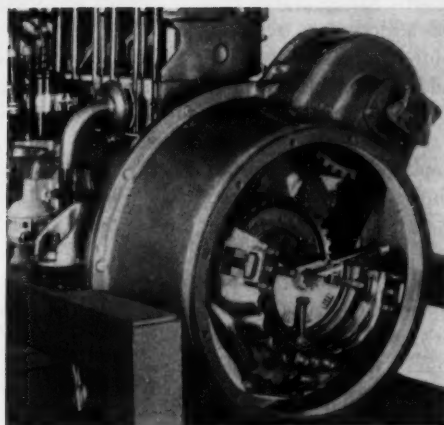
## White gives you a Competitive Edge because...

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We'll custom-engineer your new WHITE 4264S's to do the exact job you want them to do. We ask just one thing: keep track of how much you save on operating costs with your WHITES. Then add it to what you saved on original cost. We think you'll see (in big, black figures) how WHITE gives you a competitive edge in the '60 profit showdown.

THE WHITE MOTOR COMPANY, CLEVELAND 1, OHIO

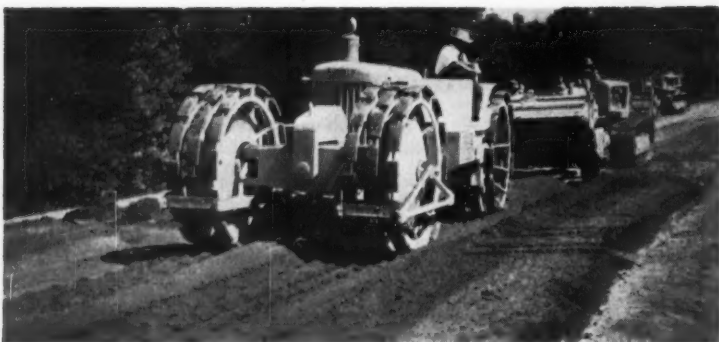
*Branches, distributors, dealers in all principal cities*



The belt was built to WHITE specifications, and illustrates cog-pulley principle of new PTO. Belt has 27 helically-wound steel cables, encased in neoprene and nylon-covered for maximum life.

WORLD LEADER IN HEAVY DUTY TRUCKS  ...60 YEARS OF LEADERSHIP

# WHITE



Holtz says: "This is an end result specification in which the required soil density is specified in terms of a laboratory standard. I think the end result specification is advantageous to us when we are performing line-type or standard structure work, which spreads out for long distances."

This last statement is quite significant for road work.

At a conference on Increasing Highway Engineering Productivity held in Boston, in a symposium on "Need for Improving Construction and Contract Procedures," E. D. Moore of the Lane Construction Co. said: "Much of the confusion and added costs resulting from varying specification requirements could be eliminated if specifications were written to require only end results, leaving the constructing methods to the ingenuity of the contractor."

During the same discussion, P. H. Rice of the Manchester Sand, Gravel & Cement Co. said: "Maximum use should be made of the contractor's creative abilities, and specifications should emphasize the end result rather than the method to be followed. If a competent contractor is able to devise methods of performing an operation for less money than a competitor, he should be permitted to do so, and the savings would be reflected in his bid price."

In fairness, it must be said that this opinion is not universally held by all contractors. One prominent southern roadbuilder says: "As

long as specifications are subject to the human element of determining compaction tests, it is difficult to be too consistent in one's operations. Until this can be corrected, my opinion is that more method would be preferable to more end result. However I feel confident we are all working toward better methods of tests and, once they are stabilized, end results should be preferable."

It must be emphasized that specifications calling for end results in terms of a standard must also be specific as to the number, type, and description of tests. End results are specified in relation to laboratory densities; for example, "90% of Modified Proctor." This means the in-situ test must be at least 90% as dense as the laboratory standard test was. Duplication of laboratory results in the field can be routine, but it is again a matter of plain old human variation.



Toward relieving some of this confusion, Olko further states that "It has been my experience that most controversies concerning soil compaction revolve around the test procedures themselves. In many instances it is customary for the contractor to pay for the soil tests, which are performed by a reputable laboratory approved by the engineer. It is therefore essential that the soil test specifications be detailed. They should state not only the tests to be made and the methods, but also how many tests are required per length of roadway or cu yd of fill.

"It is also helpful to list the names of laboratories that are acceptable. But you should always permit the contractor to engage others having equal facilities and experience. All this information is necessary for the contractor to submit a realistic competitive bid and not begrudge testing costs at a later date."

It must be emphasized that any specification, regardless of type, must be as complete and concise as possible without bogging down in excessive wordiness or hamstringing by confusion or double meanings.

It should be noted that there are only three general variations in end-result standards. They are Proctor, Modified Proctor, and a few special local methods.

#### How Specs Compare

In order to make fair comparisons of specifications and be able confidently to review their relative merits, a rather exhaustive and comprehensive study was made of the latest existing specifications for highway fill compaction. Condensed to their basic elements, these are set out for general use beside each other in Table I, page 226. It shows when the specs were written, what end results and equipment are required, and comments on methods.

*continued on page 230*



*Hopto's greater digging depth, loading height, reach and swing are not the whole story . . .*

# MEASURE **Hopto**®

**BY THIS KIND OF  
WORK CAPACITY**



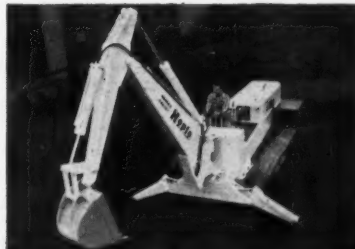
This Model 200 SPR self-propelled wagon ripped through four to eight inches of asphalt and dug out culverts of wood, steel and concrete pipe in digging a four-foot trench ninety feet long. Time required: less than one-fifth of time estimated!

STATE HIGHWAY OFFICIALS watched and timed a HOPTO Hydraulic Excavator knock six and one-half hours from their eight-hour estimate of a culvert replacement project! Handling rubble, boulders, slabs of concrete and pipe was fast and easy with the one-man Hopto.

Listed here are but a few of Hopto's features that paid off in greater work capacity.



**MODEL 200-TM** Truck mounted, all-hydraulic with triple action system for full power on simultaneous, multiple actions.



**MODEL 200-SPC** A self-propelled crawler-mounted unit with all the features and work capacity of the other 200 Series Models.

#### **SWING:**

180° uninterrupted swing gives fast, easy placement of spoil.

#### **REACH:**

Hopto's 19' reach offers flexibility for ripping out culverts and rubble.

#### **DIGGING DEPTH:**

13' 10" digging depth gives proper depth capacity at good reach.

#### **LOADING HEIGHT:**

11' 2" clearance. Evenly distributes heaped loads into highest trucks.

#### **MOBILITY:**

One man operates . . . swivels to driving controls.

#### **BUCKET ACTION:**

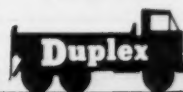
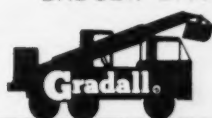
Wrist-action firmly holds rubble, boulders and broken concrete against dipper stick for fast, safe removal and loading.

Brief 'specs' above are for the Model 200 SPR

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BADGER DIVISION • WINONA, MINNESOTA



# EARTH COMPACTION... continued

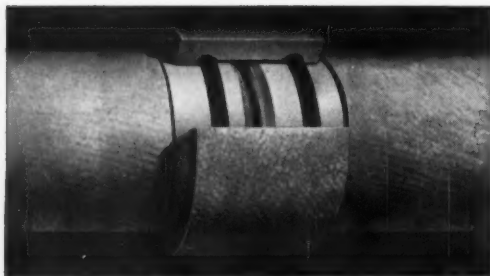
STATE	EQUIPMENT SPECIFICATIONS FOR							
	DATE OF SPEC'N.	DENSITY	STEEL WHEEL		TAMPING		PNEUMATIC	
		PERCENT	TYPE	SIZE	TYPE	SIZE	TYPE	SIZE
1 Alabama	1950	100-110 AASHTO T-180	3 Wheel	10 T	S.F.	Min 5' x 4" 200 psi	2 Axle	325 #/Inch of Tire Width
2 Arizona	1948	95 T-99	3 Wheel Tandem	10-14 T	2 Section	4-13' x 4" 1100 #/Tooth	2 Axle 5-7' Wide	1400 #/Tire
3 Arkansas	1957	95 T-99	END	RESULT				
4 California	1954	100 Top 2' 95 Cal. Impact	3 Wheel	12 T 325 #/I.W.	Yes	Min. 8' Wide 4-12' x 4" 250 #/I.W.	Yes by Permission of Engineer	
5 Colorado	1958	95 A-1 to A-3 100 Other T-99	ANY TYPE OF EQUIPMENT WHICH WILL PRODUCE DESIRED DENSITY IS PERMITTED					
6 Connecticut	1955	90 Dry	Perm but type not specified	10 T	By perm'n of engineer Type & size not specified		NOT SPECIFIED	
7 Delaware	1957	100-105 AASHTO T-180	Perm but type not specified	10 T	Yes	4-12' x 4"	1 or 2 Axle	300 #/I.T.W.
8 Florida	1959	100 T-99	NO EQUIPMENT REQUIREMENT FOR EMBANKMENT COMPACTION					
9 Georgia	1956	100 Max. dry wt. T-99	ADEQUATE EQUIPMENT					
10 Idaho	1957	95-100 T-99	CONTRACTOR'S CHOICE EXCEPT FOR SELECT BORROW					
11 Illinois	1958	90 of Max dry wt. 100 T-99	3 Wheel	Min. 10 T	Yes	Min 8 ft. wide 100 psi	Min. 9 tires 2 Axles	Min. 225 #/I.T.W.
12 Indiana	1957	95 Mod T-99 90	3 Wheel	Min. 10 T	Yes If approved		Yes If approved	
13 Iowa	1956	95 Max. density T-99	Yes If approved		Yes	200 PSI on full wt. 4-12' x 4" 200 PSI	Yes If approved	
14 Kansas	1955	90-100 Varies T-99	Yes by approval	of engineer	Yes	2 Drum S.F. or Tamping	Multiple Wheel	225 #/I.T.W. 45 #T Press. 400 to 600 #/I.T.W.
15 Kentucky	1956	95 Extra T-99 None comp.	Yes If approved				Yes	
16 Louisiana	1955	95 T-99	ANY COMPACTION METHOD MAY BE USED WHICH PROVIDES THE REQUIRED DENSITY					
17 Maine	1956	90-95 Cont dens. None layer meth. 90-100 Fills 10' - 95-100 10' +	Yes		S for tamping for clay or loam S.F. or top self cleaning	Min. 200 PSI of bearing area 200 PSI	Yes for sand or gravel	
18 Maryland	1957		3 Wheel	10 Ton 300 #/I.T.W.			9 Tires 2 Axles	GV 10 T 300 #/I.T.W.
19 Massachusetts	1953	None Soil class 95 of max. T-99 unit wt.	Perm but type not spec.	12 T 360 #/I.W.	Twin cylinder app'd by engr.		No prov'n.	
20 Michigan	1957		NO EQUIPMENT REQUIREMENT					
21 Minnesota	1959	100 Top 3' 95 Below 3'	Permitted, type not specified	Not spec'd	Required 4 passes in top 3' of embankment		Permitted	Not spec'd
22 Mississippi	1956	90 Clay T-99 95 Sand T-99	Yes If approved by engr	Not spec'd	Self cleaning	4-10' x 4" 200 PSI	Yes 2 Axle-7W.	8 ton GW
23 Missouri	1955	90 Max. den. T-99 95 Br. ngr.	Not specified		Yes	100 PSI	None specified	
24 Montana	1959	90-100 AASHTO in 5 steps T-99	3 W Tamping	10 T 5-10 T	SF or tamp'g approved by engr.	4-8' x 4" 300 PSI	2 Axle, smooth tires	48-60" wide 250 #/I.T.W.
25 Nebraska	1955	95 T-99	3 Wheel 18-24" rear Wh. width	275 #/I.T.W.	S.F. or tamping	4-12' x 4" 200 PSI	Multiwheel	Min. 200 #/I.T.W.
26 Nevada	1957	93 Nev. compn test	3 W tandem	10 T 300 #/I.W.	S.F. 2 unit	105-250 PSI Min 5.4' x 4"	9 Tires 2 Axles	1000-2000 # W.L. 43-300 #/I.T.W.
27 New Hampshire	1954	95 T-99	NO EQUIPMENT REQUIREMENT					
28 New Jersey	PENDING	95 T-99		10 T	Yes	Min. 200 PSI	Yes	225 #/I.T.W.
29 New Mexico	1954	100-95 T-180 105 Top 6" 90 T-99 95 Gran soil	Borrow 3 W Yes-slag, gravel, rock	10 T 325 #/I.W.	Dual drum eq. 60" dia 60" long S.F. for silts & clays	5-8' x 4" 500 PSI 200-450 PSI Min 7" foot Min 5' x 4"	2 Axle 4-9 Tires Yes. For sand & gravel	1000-2000 # W.L.
30 New York	1957		AASHTO Flat WH power 3 Wheel 4	10 T 330 #/I.W.	Self cleaning S.F. Self cleaning S.F. Multi unit osc.	4-9' x 4" Min 200 PSI Min 7" foot Min 150 PSI	2 Axle Vibrating or static	Min 60" wide Min 325 #/I.T.W. Min 30 ton app'r. by engineer
31 North Carolina	1952	Max. dry dens 95 AASHTO T-99	Not perm.	Not perm.				
32 North Dakota	1956							
33 Ohio	1959	95-100 Lab Max 10' 96-102 10' +	3 Wheel	Min 10 T	S.F. & tamping	Not specified	Single or 2 axle	Not specified
34 Oklahoma	1959	95 T-99	NO EQUIPMENT REQUIREMENT FOR LAYER METHOD EXCEPT AT BRIDGES -					
35 Oregon	1954	95 top 3' T-99 90 below 3'	NOT PERMITTED		S.F.	4-9' x 4" Min 150 PSI	Yes	150-350 #/I.T.W.
36 Pennsylvania	1954	90-100 10' - 95-100 10' +	3 Wheel	Min 10 ton 330 #/I.W.	Permitted	250 PSI	Yes	1000 # wh. load
37 Rhode Island	1946	No reqmt	3 Wheel	Min 10 T	Permitted		Permitted	
38 South Carolina	1955	95 T-99	NO EQUIPMENT REQUIREMENT					
39 South Dakota	1957	92 AASHTO T-99 100 mod.	Yes - If approved by the engineer		Multiple S.F. self cleaning	60" W x 60" long 4-8' x 4" 300 to 550 PSI 7' 4-8' x 4" 200 PSI	YES - If approved by the engineer	
40 Tennessee	1951	AASHTO 95 T-99	Not specified		S.F. req'd 2-3 M.P.H.		Yes 2 axle min 7 wheel	Gr wt 8 tons
41 Texas	1951	96-102 THD-89 95-110 max. T-180	3 WH flat 48" x 20" wide 3W or tandem self-prop.	10 ton 325 #/I.T.W. Min 10 T-14 T 300 #/I.T.W.	4 drums/unit 40" x 42" long 2 drum S.F. oscillating & self-cleaning SF or tamping app'd by engr.	125-175 PSI 60" W x 60" long 6-8' x 4" 325 PSI Min 5' x 4" Min 200 PSI	2 axle 9 WH Min 3W Min 5 ft rol'g width	Min 60" wide 100-325 #/I.T.W. Min 6000 # W.L. 60 PSI T.P.
42 Utah	1958						Yes by approval of engineer	200 PSI cont. pressure
43 Vermont	1956	90 T-99	Not specified					
44 Virginia	1958	AASHTO 95 T-99	ROLLERS HAVING 200 PSI FOR AREA IN CONTACT					
45 Washington	1957	90-95 T-99	ANY TYPE CAPABLE OF COMPACTING TO THE REQUIRED DENSITY					
46 West Virginia	1952	90-100 AASHTO T-99	3 Wheel	10 ton	2 unit self-cleaning	150 PSI min 4 ft. long	1 or 2 axle	Suff. to obtain req'd density
47 Wisconsin	1957	95 AASHTO T-99	Type not specified		Yes	150 PSI	Yes	150 #/I.T.W.
48 Wyoming	1957	95 T-99	Type not specified	8-12 ton	S.F. dual drum	6-8' x 4" 300 PSI	2 axle-60" min Must give 250 #/I.T.W.	
49 Hawaii	1957	95-3' up 90-below 3' 95 AASHTO 100 in sand 95 T-99	NO SPECIFIC EQUIPMENT REQUIREMENT. COMPACTION WITH HAULING EQUIPMENT OR "APPROVED ROLLERS"					
50 District of Columbia	1957		Tandem or 3 Wheel	Min 10 ton	Tamping or S.F.	5-12' x 4" 200 PSI	Yes	200 #/I.T.W.
51 Puerto Rico	1948	95 T-99	3 Wheel *	Min 10 ton	Tamping * 2 section	25-81 cm * 1100 # per tooth	NO PROVISION	
52 Corps of Engineers A	1959	100 mod.T-180	SHEEPSFOOT, PNEUMATIC, POWER ROLLERS OR OTHER APPROVED EQPT.					
53 Corps of Engineers B	1959	T-180 mod.	SEE C of E SPEC. R03 (9/15/59) FOR VALVES FOR COHESIVE OR GRANULAR MATERIAL ABOVE AND BELOW CBR DESIGN VALUES OF 20 DEPENDING ON WHEEL LOADING EXPECTED.					

OTHER			REMARKS
TYPE	SIZE	NUMBER REQUIRED	
Grid Sp Prov			Upper 6" 100% AASHO
No Prov		1 @ 125 cy/hr	Blade Grader or bulldozer required for spreading
			Minimum 35 HP tractor for towing S.F. roller or 55 HP when towing two S.F. rollers
			Rubber tired tractor or truck for towing pneum rollers - route heavy hauling equipment over embankment or fill
			Any method that will obtain the density specified unless otherwise provided on plans or in special provisions
Yes if satisfactory to engineer		1 @ 150 cy/hr	Other rollers where permitted must provide the specified density
Permitted if satisfactory to engineer			Grading equipment to be distributed uniformly to facilitate compaction
Yes if approved by engineer			Compaction may also be accomplished by distributing hauling units over fill
(Approval by the engineer)			Tread type equipment and other mechanical means to be approved by engineer
			Compaction with pneumatic rollers is required except as approved by the engineer
			No equipment requirement for embankment compaction. Graders or bulldozers required for leveling
			Class A embankment top one foot 100% density. below top one foot 95-100%
			Class B embankment " " " " 100% " " " " one " " hauling equipment distributed over embankment
			Require 4 6 rollings with standard tamping, pneumatic or 3 wheel steel rollers & 4 2 with heavy pneumatic tired roller
			Compaction Rate: 150 C.Y./hr for standard tamping, pneumatic or 3 wheel steel rollers; 375 c.y./hr heavy pneu. tired roller
			Roller combinations MUST include one 3 wheel steel roller
No provision			Special provisions for moisture and density control
By Sp provs			A blade grader or bulldozer is required for smoothing
Approval of engineer			Hauling equipment distributed uniformly over fill
Yes if approved by engineer		1 @ 200 c.y.	10 to 15 trips with pneumatic roller on type "C" embankment
			6 to 13 trips with tamping roller. No density requirement for "Standard Compaction"
Heavy tread type	For sand or gravel		Layer method - conveying equipment shall be operated over layer being placed. No density requirement
Grid, pneumatic compactors & any other	6-15 Tons		Controlled density method - any suitable compaction equipment - 90 to 95% of maximum density in 4" CF-sliding scale
17 ton crawler tractor			Travel and construction equipment distributed over entire area.
Vibration permitted			Minimum. req'd. no. coverages & max speeds: SF&tpg 4 3 @ 5 mpc; Grid 4 3 @ 5 mpc; pneumatic 4 3 @ 10 mpc;
			3 wheel steel 4 3 @ 3 mpc; pn. comp'r. min. no. 6 5 mpc.
			Power rollers, S.F. rollers or tractors for compaction.
			No. coverages required - rollers 6; 17-ton tractors-6
			By rolling, tamping, approved grading equipment, thorough saturation with water, vibration or combinations of methods.
Grid rollers	Not specified		A motor grader of minimum 1900 lb. wt. is required for leveling during compaction: A bulldozer may be sub. in very sandy soil.
Vibratory compactors			Pneumatic - 3 wheels in front - 4 wheels in rear
As approved by engr.			Motor grader not less than 5 tons
No provisions			Disc harrows shall be minimum 10 ft. tandem, Minimum 18" discs, minimum wt 1500 lbs.
Pneum proof roller	4 50 T 4 4 tires		Pneumatic rollers shall be used in addition to or in lieu of tamping rollers when directed
Approved by engr.			Nominal rolling speed 2-3 mph. All rollers to be self-cleaning
No provision			Hauling shall be distributed over the entire area to assist in compacting the material
No provision			Each layer shall be rolled at least twice with a wheel type or tamping roller.
Approval by engineer			At least one tamping and one pneumatic roller required per 500 c.y. mlt placed per hour,
50 T Comp			or two each two-tint tamping rollers per 400 c.y. embt. per hour.
Dynamic Comp by	4 wheels		Compaction by hauling, spreading or rolling equipment
	150 PSI Tire Pr.		satisfactory to engineer.
			4 passes-steel, 5 passes pneum, 8 passes tamping, 5 passes 50 T comp, 2-5 dynamic
			Pneum or vibratory on granular soils - all but vibr. on other soils
			Also compaction by minimum 12 c.y. scrapers loaded to minimum 18 T payload 60 PSI tire press
			Installed equipment specifications are for compaction of borrow.
			Equipment for compaction must be on hand and approved by engineer before work begins
			Equipment must be in good mechanical condition
			In sandy Mt. 10 ton tractor may be used in lieu of rollers as det'd by engineer
			After over entire surface of each 6" layer
			Compacting equipment includes rollers, trucks, tractors, scrapers, graders & all Exc. Hauling & Placing equipment
			Discing, harrowing, wetting & rolling is required. For "Extra Compaction" elevating graders perm'd if layer constn. is used
Yes-as needed and as approved by engr.			Rollers shall be capable of consistently obtaining specified compaction
			Compaction of outer 5 ft. shall be obtained with tamping or pneumatic tired roller
			"APPROVED ROLLING EQUIPMENT FOR TEST CONTROLLED COMPACTION"
No provision			
No provision			Engineer may require tamping or pneum roller on outer 5 ft. of each layer
Permitted			Blade grader or bulldozer required for leveling
*If saty to the engr.			Comp'n for distributing hauling eqpt over entire area and by use of tread type equipment or sufficient 3WH 10 T Pwr. rollers.
Any method will be approved which produces 95% density			Ordinary compaction-by sheepfoot or to 95% by other methods
			Each layer shall be kept levelled by "suitable equipment to insure uniform compaction over the entire layer"
No provision		1 @ 100 c.y./hr.	Tamping roller speed 2-3 m.p.h. Permits Buffalo Springfield compactor
			Pneumatic may be used if insufficient tamping rollers.
No provision			Rolling is a bld item
As modified by the engineer			Heavy tamping rollers may be specified, 6-8 " T. feet up to 550 PSI
Special provisions		1 @ 150 c.y./hr.	Tamping rollers required except embts. < one ft high where pneumatic, 3 wheel or tandem power rollers may be used.
No provision			Blade grader, scraper or dozer required. Min. 6 trips over entire area with S.F. or tamping roller required
			If req'd comp'n cannot be obtained by rolling other approved methods shall be req'd by engineer. All rollers must be app'd by engr.
			Equipment for pulling rollers may be required to be available at all times
			S.F. or similar type required where fills are made over old highway.
No provision		1 @ 100 c.y. on std. comp'n.	Partial compaction by hauling equipment permitted providing density is obtained for full width and depth.
Vibratory or other if app'd by engineer			Std. compaction - trucks, caryalls, scraper, tractors or other hauling eqpt NOT considered rolling in lieu of 3W. tamping or pneum rollers but shall be distributed over fill. Graders, dozers or other suitable eqpt. appr. by engr. req'd. for levelling & smoothing.
50 ton pneum. by appr'l of engineer			Partial compaction with hauling equipment
			Motor grader required on fill at all times
			Roller requirements shown on plans or ordered by the engineer.
			Compaction or original ground required.
No provision			
No provision		one @ 100 c.m. per hour	*For "Extra Compaction"
			For layer placing - hauling & spreading eqpt. shall be operated over the full width of each layer

# K&M

## ASBESTOS- CEMENT PRESSURE PIPE

its bore stays clean year after year



The finest coupling in the industry! Exclusive patented "K&M" FLUID-TITE Coupling connects in two easy steps. Seals tight and stays tight . . . no matter how high the pressure climbs. Sealing rings are self-energizing. No cumbersome coupling puller is required. And, a 5° deflection per coupling if you need it.

**"K&M"** Asbestos-Cement Pressure Pipe is as modern as the Jet Age in which we live. This tax-saver sends maintenance costs tumbling.

The bore remains smooth and clean . . . no clogging and no rusty discoloration of water . . . and pumping costs remain low. Being made of tough, high-tensile-strength asbestos fibers and portland cement, "K&M" Asbestos-Cement Pressure Pipe is practically indestructible. Won't corrode or tuberculate. And, it's completely immune to electrolysis. Joints are permanently, automatically root-tight and water-tight.





## for uninterrupted, trouble-free service

"K&M" Asbestos-Cement Pressure Pipe is a thrifty pipe. Its low initial cost is often your last cost. Its lightweight reduces shipping and handling costs.

This thrift carries over into installation. You can install "K&M" Asbestos-Cement Pressure Pipe in practically all kinds of weather and soil conditions . . . with unskilled labor . . . and without heavy machinery. In fact, you can lay more pipe per hour than you've ever done before.

What makes "K&M" Asbestos-Cement Pressure Pipe so special? Eighty-five years of asbestos

engineering by one of America's pioneers in asbestos products. Put this wealth of experience to work for you. Write to us today. Dept. P-1440.



**KEASBEY & MATTISON**  
COMPANY • AMBLER • PENNSYLVANIA

# EARTH COMPACTION...

continued

Note that of the 53 specifications under study, all but 14 are dated 1955 or later. Of those 14, only one was written in 1950, two in 1948, and just one, a "method only" specification, in 1946. The remaining 39, then, are five years old or less, and one is still in the pending stage.

About 80% of the agencies spell out in considerable detail the type of equipment to be used in getting the required density. The others specify only a required density, leaving the method up to the contractor.

BPR spokesmen make some rather pregnant observations based on a study of their own which was similar in some respects to this one. In essence they say that steel wheel rollers, including tandem rollers of 8 to 10-ton capacity and 3-wheel rollers of 10 to 14-ton capacity, are permitted in a majority of the specifications. Several specifications call for steel wheel rollers where such materials as slag, coarse gravel, rock, or layers of soil and rock are encountered.

Nearly 80% of the agencies have specific requirements for sheepfoot and tamping rollers: The general type, area of tamping feet and/or unit pressure of contact area are specified. The range of minimum contact pressures specified in 31 states varies from 100 to 500 psi. The difference between low and high is 400%. Several states have maximum contact pressure requirements. These vary from 175 to 550 psi without qualifications. This is a variance of more than 200% between extremes. In actual practice, contact pressures up to 750 psi have been employed on sheepfoot rollers to break up flat rock and shale. In some cases, though, they can break down the soil's structure.

Almost all agencies allow the use of pneumatic rollers in embankment compaction, with seven permitting their use when ap-

continued on page 234

## Min. Density, Max. Layer Thickness, & Equipment Required

(called for in special provisions)

Min. Density, Max. Layer Thickness, & Equipment Required (called for in special provisions)		COMPACTING EQUIPMENT																
		Maximum Layer Thickness						Pneumatic Tamping				Steel			Other			
		STATE	Density Percent	5"	6"	8"	9"	12"	18"	Super Comp'tor 50T & over	Truck-Type	Sheepsfoot	Grid	3 Wheel	Tandem	Vibratory	Graders and/or B.D.	Hauling Equipment
Alabama	95-100			L					✓	✓	✓	✓	✓				✓	
Arizona	95-100	C		L					✓	✓	✓	✓	✓	✓				
Arkansas	95			L					END	RESULT								
California	90-95			L					A	✓		✓					0	
Colorado	95-100			L					END	RESULT							✓	
Connecticut	90					L			A	✓		✓						
Delaware	95	L							R	✓		✓					0	
Florida	100		L						No Equip. Requirement for Emb. Comp.									
Georgia	100	L							✓	END	RESULT							
Idaho	95-100									✓	END	RESULT						
Illinois	90	L							✓	✓	A						(1)	
Indiana	90-95				L				A	A			R				0	
Iowa	90-95									✓	✓	✓	✓	✓			(6)	
Kansas	90-100	C							A	✓	✓	✓	A	A			0	
Kentucky	95					L			✓	✓	✓	✓	A	A			0	
Louisiana	90-95			L					END RESULT									
Maine	90-95			L		L			✓	✓	✓						(6)	
Maryland	90-100		L						R	✓	✓	✓	✓	✓	✓		(3)	
Massachusetts	NONE					L			A (6 PASSES)				A (6 PASSES)				(7)	
Michigan	95				L TO	L			END RESULT									
Minnesota	100	C								✓	✓		✓					
Mississippi	90-95		L							✓	✓		A				0	
Missouri	90-95									✓	✓							
Montana	90-100		L							✓	✓		✓			R (6)	0	
Nebraska	95		L							✓	✓		✓					
Nevada	90			L						R	R		✓	✓				
New Hampshire	95					L				END	RESULT							
New Jersey	NONE	L							A	✓	✓	✓	✓	✓	A			
New Mexico	95-100			L					✓	✓	✓		✓				(4)	
New York	70-95			L						✓	✓	R	✓					
North Carolina	90	L								✓	✓	✓	✓			✓	✓	
North Dakota	95					L				✓	✓	✓						
Ohio	95-100			L						✓	✓		✓				0	
Oklahoma	95			L						END	RESULT							
Oregon	90-95			L						✓	✓	✓						
Pennsylvania	90-100			L						✓	✓	✓	✓	✓	✓			
Rhode Island	NONE					L				A	A		✓			✓	10	
South Carolina	95	L								END	RESULT							
South Dakota	92-100		L							A	✓		A	END	RESULT			
Tennessee	95	C							A	✓	✓							
Texas	98-100		L							✓	✓		✓	✓				
Utah	95-100			L						✓	R		✓	✓			10	
Vermont	90					L				A	A (6 PASSES)		✓	✓		R		
Virginia	95			L						✓	R		✓	✓	✓		(5)	
Washington	90-95			L					END	RESULT								
West Virginia	90-100			L						✓	Any approved type of eq't							
Wisconsin	95					L			END	RESULT								
Wyoming	95-100	L							✓	✓	✓		✓			(6)		
District of Columbia	95-100		L							✓	✓		✓	✓				
Hawaii	90-100			L					NO SPECIFIC REQUIREMENTS									
Puerto Rico	95			L						✓		✓	✓					

L—Loose layers

C—Compacted layers

0—Other types may be used if approved by engineer

A—May be used if approved

R—Required

(1)—Six rollings w. std. rollers; two w. hvy. pneu.

(2)—Six to 15 trips w. std. T or P roller


(3)—For cont. dens. method, min. six coverages

(4)—Tamp. roller req'd. for slag, coarse gravel, rocky soil

(5)—Tamp. roller req'd. on fills over old hwy.

(6)—20,000-lb grader req'd.

(7)—17-ton tractor min.



## **BENT MOUNTAIN BRIDGE WORK**

Famed Skyline Drive in Virginia is getting a new look these days as a 40-ton, 43-M truck crane helps erect spans for an overpass situated 1900 ft. up the side of Bent Mountain near Roanoke. Using positive-acting Marionair control, these 35-ton prestressed beams are quickly hoisted in place with pinpoint accuracy.

Because of the steep switchbacks and narrow, short turns, the trucks which hauled the concrete beams had to be lifted around some of the curves. The Marion handled the job easily... without outriggers.

More proof that Marion cranes are the machines for you? Your nearest Marion distributor has it.

*You get*

**MORE**

*with*

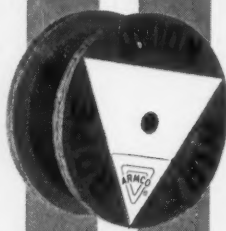
**MARION**

**Marion Power Shovel Company, Marion, Ohio**

*A Division of Universal Marion Corporation*

April 1960—CONSTRUCTION METHODS and Equipment—Page 231

# UNION



## The \*Live Wire Rope Organization

*\*Charged with creative energy*

To be dubbed "live wire" by customers is nice. But it also is a warning signal which alerts our organization to stay alive to the fact that a greater output of creative energy is necessary when you're in front running position.

In the Union research laboratory and in those of the steel producing organization in which Union is integrated, technicians are hard at work on many new projects. They were started and will be finalized in the field where Union engineers spend more time than in the laboratory.

Classic example of what results from such deep and constant probing is the Tuffy

family of wire ropes and slings, each one of them engineered to a specific job. Among 1600 standard wire rope constructions, in day to day production, none could be classified as the ultimate low cost wire rope for bulldozers, draglines, scrapers or hoisting equipment. One by one new metallurgical specifications and rope and sling constructions were tailored to meet the different but tough operating conditions inherent in the jobs these machines perform.

Tens of thousands of applications have established the unchallenged supremacy of Tuffy special purpose wire ropes and slings.



## Tuffy Wire Ropes and Slings are "Job Prescribed" for Tough Jobs



**Tuffy Balanced  
Dragline Rope**



**Tuffy Balanced  
Scraper Rope**



**Tuffy Balanced  
Dozer Rope**







At Mount Rushmore National Memorial in South Dakota small fissures in the sculptured faces of Washington, Jefferson, Lincoln and Roosevelt are being sealed with granite dust and white lead. Though the granite sculpture is estimated to last for thousands of years, this preventive maintenance will keep the surfaces smooth and slow the natural erosion process. The insert shows how workmen are suspended on Union Wire Rope.



**Tuffy Balanced  
Slings and  
Hoist Lines**



2-C



**For "Live Wire" Service—  
Look Up Your Union Distributor  
in the Yellow Pages**

When you get him on the wire, you're sure to get the best in wire rope and slings—plus service that helps you get from Union Wire Rope products all the quality and long life Union builds into them. Union Wire Rope Corporation, 2270 Manchester Avenue, Kansas City 26, Missouri.

**UNION**  **Wire Rope**

**Subsidiary of ARMCO STEEL CORPORATION**

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company  
Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Southwest Steel Products

## **Tuffy** *Wire Rope* **Tips**



**Guard Against These  
Killers!...Get the Full  
Measure of Service—  
Life Built In By Wire  
Rope Specialists.**

### **Rusty Road to Ruin**



Rust—No. 1 enemy of steel—takes a heavy toll in wire rope life. The one-strand break shown here resulted when the rope was allowed to become rust-bound through lack of lubrication. Tests show that properly lubricated rope has up to 10 times the life expectancy of dry rope.

### **Crushed by a Tractor Cleat**



The Sunday punch for this piece of wire rope was delivered by a tractor cleat—just one of many crushing injuries caused by rope being run over or banged into by hard, sharp objects. Even the toughest wire rope is no match for this kind of mistreatment.

### **After a Suicide Jump**



This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

### **Burned on a Frozen Sheave**



End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.

Would you like a copy of a booklet in which more than a score of Tuffy Tips like those above are reproduced. If so, write Union Wire Rope Corporation, 2270 Manchester Ave., Kansas City 26, Missouri.

## EARTH COMPACTION . . .

continued

proved by the engineer. Minimum and maximum width, number of axles, and minimum number of wheels are sometimes specified. But there are at least four methods now in use in expressing the compacting ability of pneumatic rollers. These are: gross weight of vehicle, wheel or tire load, weight per inch of tire width, and tire inflation pressure.

Several states specify the tire inflation pressure. This is of limited significance without tire size and wheel load. Contrary to popular belief, inflation pressure and contact pressure are not necessarily synonymous. While developing "special provisions" for test rolling with a heavy pneumatic compactor, the Michigan State Highway Department in 1958 realized the need for better criteria in rating the compacting ability of pneumatic rollers. Part of the special provision states:

"The contractor shall furnish, to the engineer, charts or tabulations showing the contact areas and contact pressures for the full range of tire inflation pressures and for the full range of loadings for the tire furnished."

When such values are related to compacting performance on different types of soils under varying moisture conditions, it will provide the type of information needed to eliminate detailed equipment requirements in compaction specifications.

Nearly 33% of the agencies do not permit the use of vibratory compactors and rollers, heavy pneumatic rollers, grid rollers, and



segmented pad rollers. The use of such equipment items in 50% of the remaining states must be approved by the engineer. A large

number of states, therefore, have no clear-cut provisions for use of the newer and more promising embankment compaction units.

## GLOSSARY

**AASHO**—American Association of State Highway Officials.

**AGGREGATE (COARSE)**—Crushed rock, or gravel of screened sizes; used as fill material in base courses.

**AGGREGATE (FINE)**—Sand or fine crushed stone for filling voids in coarse aggregate.

**ASTM**—American Society for Testing Materials.

**BACKFILL**—Material used in refilling a cut or other excavation, or the act of such refilling.

**BALLAST**—Heavy material, such as water, sand, or metal which has no function in a machine except to increase its weight.

**BANK**—A mass of soil rising above an average level. Generally, any soil which is to be dug from its natural position.

**BANK GRAVEL**—A natural mixture of cobbles, gravel, sand, and fines.

**BANK YARDS**—Yards of soil or rock measured in its original position, before digging.

**BASE**—The course or layer of materials in a roadway section on which the actual pavement is placed. It may be of many different types of materials ranging from selected soils to crushed stone or gravel.

**BERM**—An artificial ridge of earth, generally side-slopes of a roadbed.

**BINDER**—Fines which fill voids or hold gravel together when it is dry.

**BLUE TOPS**—Grade stakes whose tops indicate finish grade elevation.

**BORROW PIT**—An excavation from which fill material is taken.

**BPR**—U. S. Bureau of Public Roads.

**BUREC**—U. S. Bureau of Reclamation.

**CLAY**—A heavy soil composed of particles less than 1/256 mm. in diameter.

**CLEAN**—Free of foreign material, in reference to sand or gravel means lack of binder.

**COHESION**—The quality of some soil particles to be attracted to like particles, sticking together.

**COHESIVE MATERIAL**—A soil having properties of cohesion.

**COMPACTED YARDS**—Measurement of soil or rock after it has been placed and compacted in a fill.

**COMPRESSION**—For steel wheel rollers,

the compacting effect of the weight at the bottom of the roll, measured in pounds per lineal inch of roll width.

**CORE**—A cylindrical piece of an underground formation, cut and raised by a rotary drill with a hollow bit. The impervious center of an earthfill dam.

**CROWN**—The elevation of a road surface at its center above its elevations at its edges, to encourage drainage.

**DATUM**—Any level surface taken as a plane of reference from which to measure elevations.

**DEADHEADING**—Traveling empty from dumping area to loading point.

**DENSITY**—The ratio of the weight of a substance to its volume.

**EMBANKMENT**—A fill whose top is higher than the adjoining natural surface.

**FINES**—Clay or silt particles in soil.

**FINISH GRADE**—The final grade required by specifications.

**FOOT**—In tamping rollers, one of a number of projections from a cylindrical drum (the base of).

**FROST LINE**—The greatest depth to which ground may be expected to freeze in a given location.

**GRADE**—Usually the elevation of the surface of the ground at points where it meets a structure. Also, surface slope.

**GRAIN SIZE CURVE**—A graph of the analysis of a soil showing the percentage size variations by weight.

**GRANULAR MATERIAL**—A sandy type of soil whose particles are coarser than cohesive material and which do not stick to each other.

**HAUL, AVERAGE**—The average distance material is moved from cut to fill.

**HAUL, FREE**—The distance every cubic yard is entitled to be moved without an additional charge for hauling.

**IMPERVIOUS**—Resistant to movement of water.

**IN SITU**—The natural undisturbed soil in place.

**LIFT**—A layer of fill as spread or as compacted.

**LIQUID LIMIT**—The water content at which the soil passes from a plastic to a liquid state.

**LOAM**—A soft, easily worked soil con-

## Next Month

The second article on earth compaction will cover *Material—the soil that is worked with*. It tells how to determine facts you must know to bid intelligently, explains soil types and behavior, and details tests you can make to insure proper compaction results.



**Job for Autocar . . .** This six-wheel drive C5566 gets the mix to the site regardless of weather or terrain.

## **New 6 x 6 mixer goes through thick and thin ... thanks to Autocar**

**This is really** an all-weather, all-terrain job—one of those where nothing less than an Autocar would do.

In a hole or up a hill, on shifting sand or in sticky gumbo, this all-wheel-drive Autocar delivers the mix

on schedule . . . a schedule that construction men know they can depend on day in and day out.

Choice of an Autocar means that your truck will be custom-engineered to its specific job. Precision building

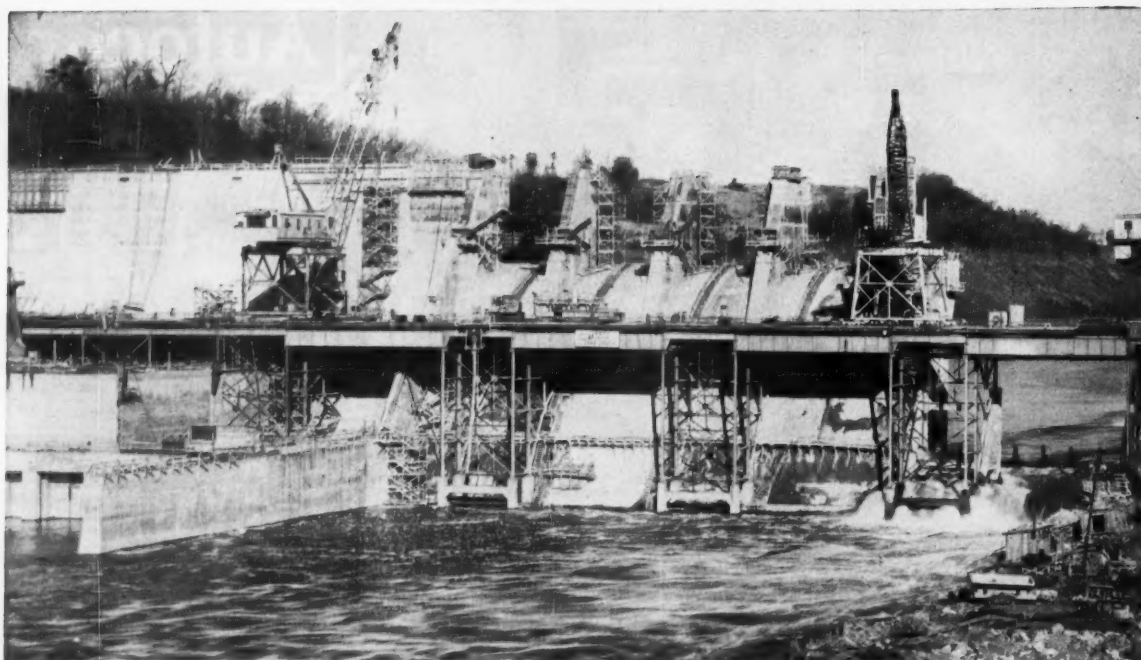
plus Autocar quality means that it will stay on the job longer with greater economy. Why settle for less than the "World's Finest?"

White-Autocar comprehensive service throughout the U. S. A.



Division of  
The White Motor Company  
Exton, Pa.





Clyde Whirley No. CW-3264 on Douglas Dam job. Also shown is No. CW-3266, now in use at Widows Creek Steam Plant near Stevenson, Ala.

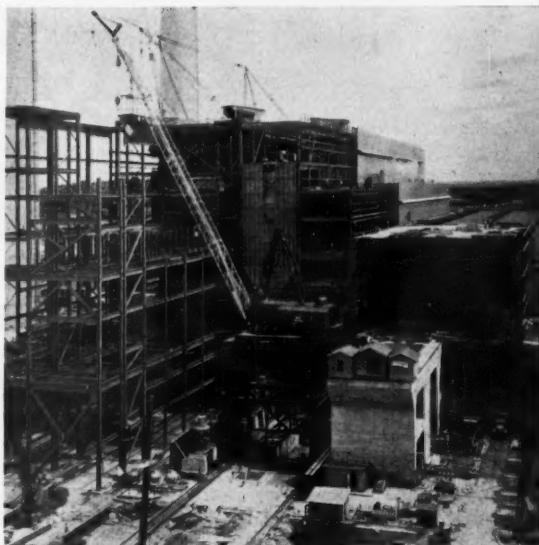
**Performance record of Crane No. CW-3264 shows why**

## **Clyde Whirleys are best for dam construction**

The severest appraisal of value of a machine is its record of performance . . . its use and re-use on work for which it has been engineered. Continued re-use over many years writes a record of longevity of useful and profitable service such as this record of Clyde Whirley No. CW-3264:

- 1940** Received new at Cherokee Dam near Jefferson City, Tenn.
- 1942** Douglas Dam near Dandridge, Tenn.
- 1943** Fontana Dam near Bryson City, N. C.
- 1946** Sold. Used at Davis Dam near Kingsman, Ariz.
- 1950** Re-purchased by original owner. Used at Boone Dam near Elizabethton, Tenn.
- 1952** Fort Patrick Henry Dam near Kingsport, Tenn.
- 1953** Gallatin Steam Plant near Gallatin, Tenn. through 1959.
- 1960** Colbert Steam Plant near Tuscumbia, Ala.

Pre-World War II and into the 'sixties'! Re-purchased by the original owner! What better recommendation for the quality engineering and rugged and dependable construction of Clyde Whirleys . . . or any other material handling equipment that bears the Clyde trademark?



Clyde Whirley No. CW-3264 at work on the Gallatin Steam Plant. Boom length has been increased to 167'. Gantry has been increased to 62' and will be increased to 95' for Colbert Steam Plant job. Hoist motor size has not been increased.

**. . . and No. CW-3264 is still in the prime of its youth!**



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**HOISTS • DERRICKS • WHIRLEYS • BUILDERS TOWERS • UNLOADERS • CAR PULLERS • ROLLERS**



## EARTH COMPACTION ...

continued

### GLOSSARY

taining sand, silt, clay, and decayed vegetation.

**MUCK**—Mud rich in humus or decayed vegetation.

**MUD**—Generally any soil containing enough water to make it soft and plastic.

**OPTIMUM MOISTURE CONTENT**—That percent of moisture at which the greatest density of a soil can be obtained through compaction.

**OVERHAUL**—In many highway contracts, a movement of dirt far enough so that payment, in addition to stated excavation pay, is made for its haulage.

**PASS**—A working trip or passage of an excavating, grading, or compaction machine.

**PEAT**—A soft light swamp soil consisting mostly of decayed vegetation.

**PLASTICITY INDEX**—The numerical difference between the soil's liquid limit and its plastic limit.

**PLASTIC LIMIT**—The lowest water content at which the soil remains in plastic state.

**PROCTOR**—A method developed by R. R. Proctor for determining the density-moisture relationship in soils. It is almost universally used to determine the maximum density of any soil in order that specifications may be prepared properly for field construction requirements.

**PROCTOR, MODIFIED**—A moisture-density test of more rigid specification than Proctor. The basic difference is the use of heavier weight being dropped from a greater distance in laboratory determinations. It is used principally by the Corps of Engineers and a few highway departments.

**QUICKSAND**—Fine sand or silt that is prevented from settling firmly together by upward movement of underground water.

**SILT**—A soil composed of particles between 1/256 mm. and 1/16 mm. in diameter.

**SLAG**—Refuse from steel-making.

**SOIL**—The loose surface material of the earth's crust.

**STABILIZE**—To make soil firm and to prevent it from moving.

**SUBBASE**—The layer of selected material placed to furnish strength to the base of a road. In areas where construction goes through marshy, swampy, unstable land, it is often necessary to excavate the natural materials in the area of the roadway and replace with more stable materials. The material used to replace the unstable natural soils is generally called subbase material, and when compacted is known as the subbase.

**SUBGRADE**—The surface produced by grading native earth, or cheap imported materials which serve as a base for a more expensive paving.

# Richmond Free-Fit Screed Bases can be adjusted without turning cradlehead—available for 1/2" and 3/4" supporting units



- Designed to support pipe or T-bars without deflection under heavy loads.
- Screed Holder is re-useable.
- Can be adjusted for height simply by turning the Jam Lagnut.
- Free-Fit collar permits free passage of 1/2" or 3/4" cradlehead as needed.
- Essentially rugged, dependable supports able to withstand severe screeding action.
- Legs crossed for greater strength and to eliminate deflection.
- Curved leg ends provide for only four small points of contact.

Widest range of sizes for slabs up to approx. 2 feet. Made up on request for 2 feet or over.



SCREEDING BRIDGE DECK WITH VIBRATING SCREED



**Hanger Frame Screeds** are designed to do the two-fold job of supporting screed rails while holding hanging forms. Spans up to 42 feet have been screeded with these devices. Whatever the type or size, all Richmond screeding devices provide the extra strength that saves money and assures a better concreting job.

There are more than 400 items in the Richmond line of engineered form tying devices, anchorages, inserts and accessories... Richmond's 49 years of experience stand behind them and it will pay you to use them. Send for Richmond Bulletin No. 4 dealing with Adjustable Screed Chairs—and, if you have any specific concreting problems, ask us about them... we can help you. Write to:

**Main Office: 816-838 LIBERTY AVENUE, BROOKLYN 8, N. Y.**  
**Plants & Sales Offices: Atlanta, Georgia; Fort Worth, Texas; St. Joseph, Missouri. In Canada: ACROW-RICHMOND LTD., Orangeville, Ontario.**

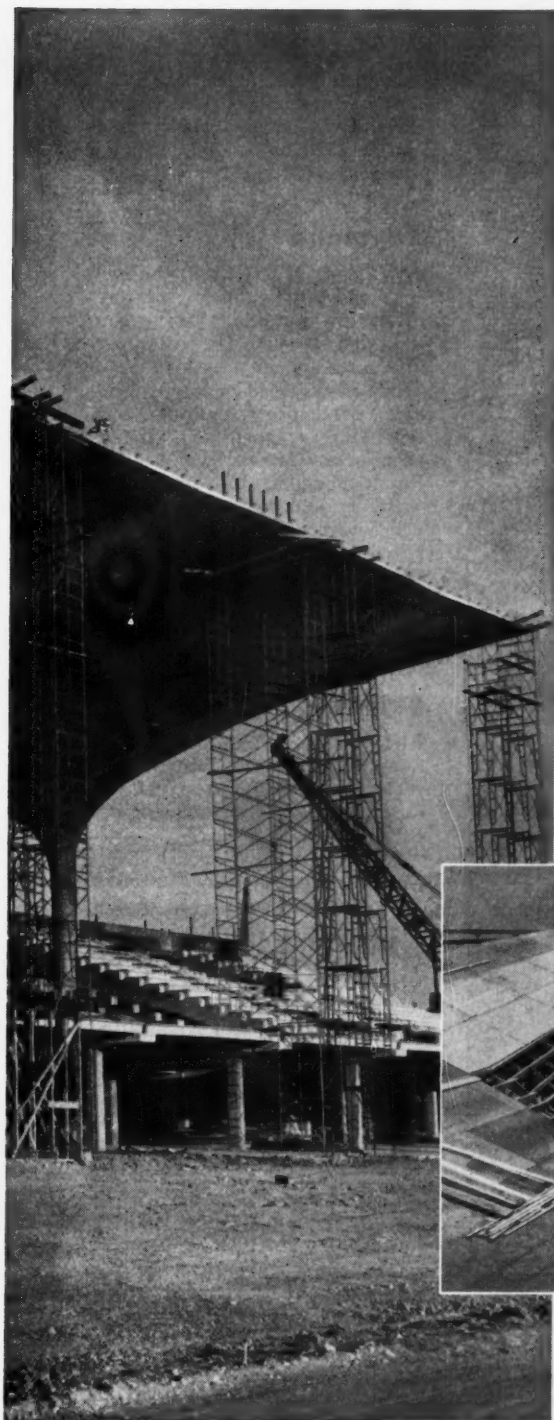


# Fir plywood helps solve problem on giant



SCIOTO DOWNS RACE TRACK  
LOCATION: Columbus, Ohio  
ARCHITECTS: Kellam & Foley, Columbus  
STRUCTURAL ENGINEERS:  
Gensert, Williams & Associates, Cleveland  
CONTRACTOR: Sheaf Construction Co., Columbus

# complex forming concrete umbrella roofs



PLYWOOD'S UNIQUE ADAPTABILITY as concrete form material simplified a complicated roof construction job at the Scioto Downs race track, Columbus, Ohio. At the same time, plywood created smooth concrete surfaces and kept costs low.

The striking grandstand roof is a series of huge hyperbolic-paraboloid concrete shells. Each 61x116-ft. section is supported by a 44-ft. column. The clubhouse and offices have thin-shell concrete folded plate roofs.

Plywood was shaped so easily to the complex curvatures of the grandstand roof, and made such tight joints, that the contractors found it needed no liner. Original specifications had been for lumber or plywood backing faced with hardboard for surface smoothness. But a single layer of  $\frac{3}{4}$ " plywood to do both jobs resulted in a smooth, fin-free concrete surface, besides eliminating the labor and material cost of applying liner.

More savings came from plywood's ease of handling, which the contractors called a real cost cutter. And rate of re-use was exceptionally high. Panels stripped from the grandstand roof were used on the folded plates and were still good for many more times. There was only a four percent loss out of 10,000 sq. ft. of plywood.

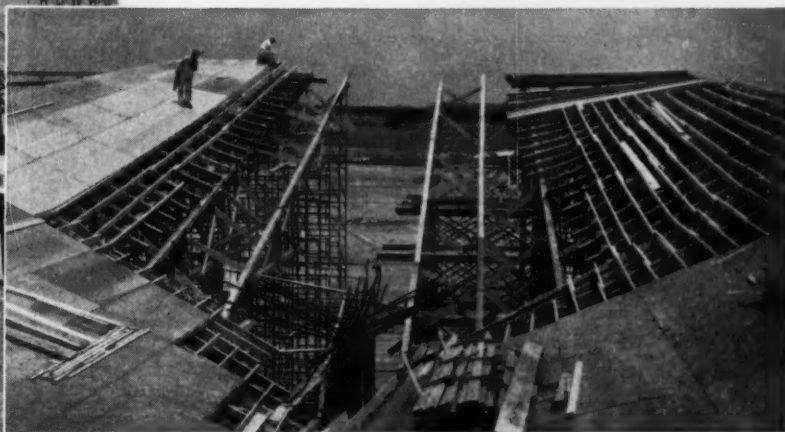
## DOUGLAS FIR PLYWOOD ASSOCIATION TACOMA 2, WASHINGTON

—a non-profit industry organization devoted to research, promotion and quality control



### ALWAYS SPECIFY DFPA-QUALITY TRADEMARKED PLYWOOD.

Concrete form grades include: INTERIOR PLYFORM®—made with moisture-resistant glue, gives up to 10-12 re-uses; EXTERIOR PLYFORM®—water-proof glue, gives up to 25 or more re-uses; OVERLAID EXTERIOR PLYWOOD—premium panel, forms smoothest concrete, gives up to 200 re-uses.



Grandstand roof forms were of  $\frac{3}{4}$ " fir plywood over a grid of 2x4's and 2x6's. Panels adapted readily to required curves, yet joints were tight and final concrete surface was smooth and even. Office building behind grandstand and clubhouse at side have continuous folded plate concrete roofs. They were formed against plywood panels previously used on grandstand roof.



# Construction Men in the News...

## Perini



**WARREN PETTINGELL** is project manager for the Hopkinton-Everett Flood Control Project at Hopkinton, N.H., an \$8.1-million project being constructed by Perini Corp. of Framingham, Mass. Pettingell heads a complex job that consists of two dams, four dikes, two canals, and two spillways scattered over a 64-sq-mi area at nine separate construction sites. He is supervising construction and engineering for the entire project.

Currently, crews are engaged in the first major step, the diversion of a river. The project is scheduled for completion in the fall of 1963.

Pettingell was graduated from Harvard in 1945 and joined Perini in 1948. In the following years, he participated in a variety of construction projects.

Prior to his present assignment, Pettingell was manager for construction and engineering on four separate contracts at Otis Air Force Base, Falmouth, Mass. And before that he was project manager for the construction of a runway at Hanscom Air Force Base, Lincoln, Mass.

As an engineer, Pettingell has participated in construction of Barnhart Island Powerhouse, a \$40-million phase of the St. Lawrence power project; in the construction of runways and facilities for Loring Air Force Base, Limestone, Maine; and in the construction of a section of the New York State Thruway at Fultonville, N.Y.

Pettingell was chief estimator on Perini's successful bid for North Springfield (Mass.) Dam.

## N.C.C.A.

**HENRY MYERS**, a partner in the Chicago concrete construction company of Charles A. Myers and Sons, is the new president of the National Concrete Contractors Association. He was elected at the association's convention in Philadelphia to succeed Bert Carey, president of Bert Carey and Co. Mr. Carey becomes an ex-officio member of the board of directors for life.

Other officers elected are: E. Ray Freeman of Dallas, Tex., first vice president; Philipp Hoerr of Peoria, Ill., second vice president; Troy Pauley of Charleston, W. Va., secretary; and William DeGraf of Chicago, Ill., treasurer.

Serving as directors are: Robert Burns of Dallas, Tex.; Elbert F. Lewis of Greensboro, N.C.; Roger Corbetta of New York, N.Y.; Carl Narducci of Akron, O.; Mike Savoea of Akron, O.; William S. Hodges of Muskegon Heights, Mich.; Allen Yost of Sterling, Colo.; and Harold Allen of Dayton, O.

The association will hold its 1961 convention in Miami, Fla.

## Vermilya-Brown



**HUGH McLAREN, Jr.**, is the newly appointed assistant to the president of Vermilya-Brown Co., 106-year-old New York City building firm. Currently, McLaren is project manager for the new engineering building at The Cooper Union in New York City.

He joined Vermilya-Brown in 1940 after receiving his civil engineering degree from Dartmouth. In 1941, he was assigned to the

construction of Kindley Air Force Base in Bermuda. He joined the civil engineering section of the Coast Guard in 1942 and served as commanding officer of a construction detachment in Newfoundland.

He returned to Vermilya-Brown in 1945 as a superintendent. In 1952 he became a project manager.

## Raymond

**JAMES J. MENNIS** is the new southeast area manager of Raymond International's heavy construction division. He will supervise sales and installations of the firm's prestressed concrete products, particularly cylinder piles for highway, port, and offshore structures. He will work out of Raymond's office in New Orleans.

Before joining Raymond, Mennis served for 15 years with firms specializing in prestressed products and lift slab construction. He is a graduate of Manhattan College in New York City with a civil engineering degree.

## Bechtel

**RUDOLF D. GRAMMATER** is a new member of the board of directors of Bechtel Corp. of San Francisco, Calif., engineering and construction firm. He is vice president and treasurer of the corporation.

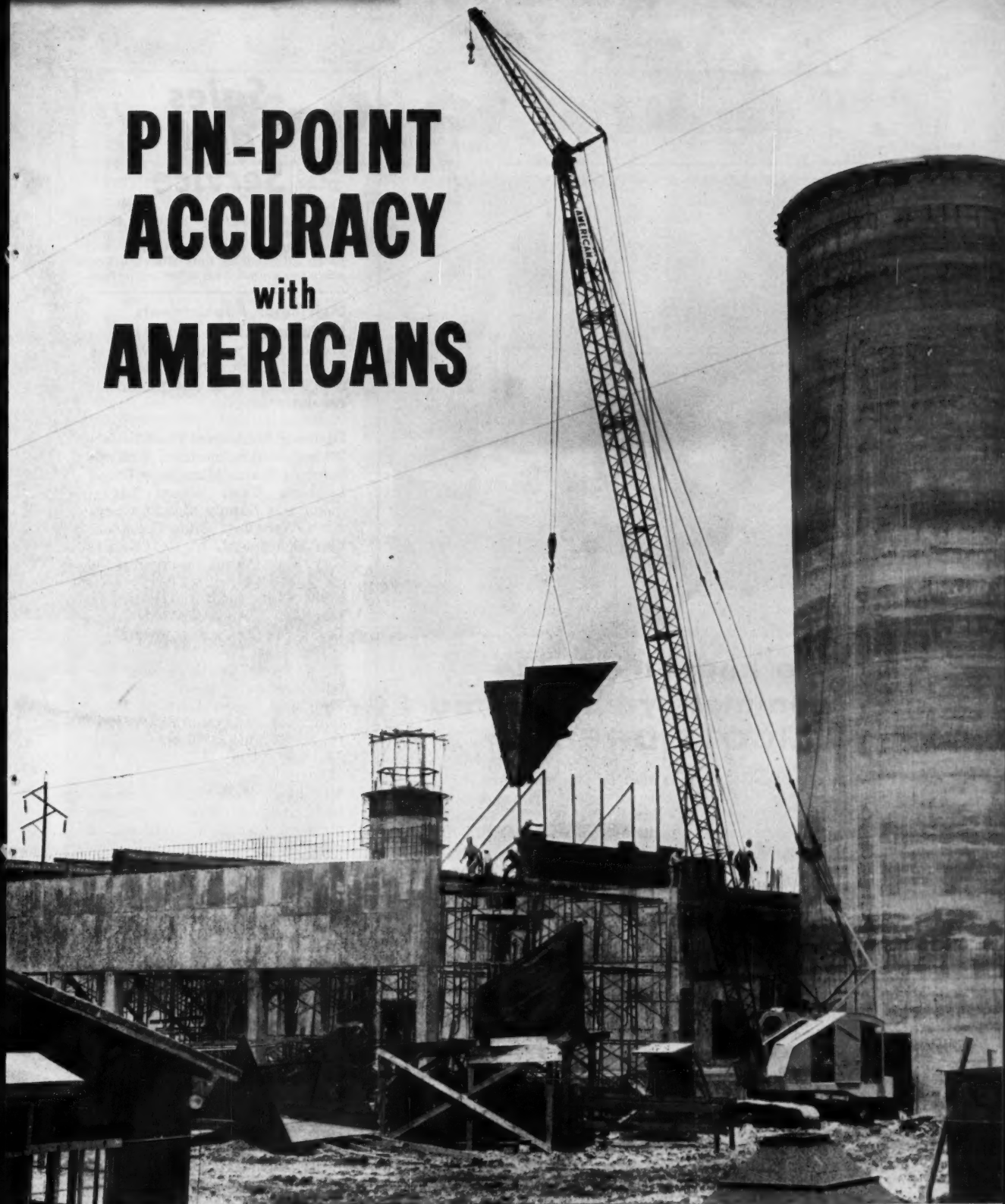
## NBCA

**BRYANT M. COLLINS** is the new president of the National Bituminous Concrete Association, elected at the NBCA convention in Detroit. He is president of Collins Construction Co. of Austin, Tex., a firm he founded with his father in 1940. The company specializes in asphalt paving and participates in heavy construction.

F. C. Leffingwell, president of the Asphalt Paving Co. of Miami, Fla., was elected vice president. Allen Snyder, president of Hefler-Snyder Co. of Garwood, N. J., was elected treasurer, and Stan Watkins, vice president of the Bituminous Surface Treating Co. of Inver Grove, Minn., was elected secretary.



# **PIN-POINT ACCURACY** with **AMERICANS**



*Talk to your American Distributor about the full line of Heavy-Duty Construction Equipment*

**AMERICAN HOIST**  
and Derrick Company  
St. Paul 7, Minnesota

EXCAVATORS-CRANES  
to 2 yds.-60 tons  
LOCOMOTIVE CRANES  
to 130 tons

DERRICKS-HOISTS  
to 800 tons  
REVOLVER CRANES  
to 400 tons

CROSBY-LAUGHLIN  
DIVISION  
Forged fittings  
for wire rope-chain



## "We know the value of a completely engineered ELLICOTT DREDGE"

Says Mr. Leonard Mulbry of the New Smyrna Dredging Company, operating in the waterway community "VENEZIA," at New Smyrna Beach, Florida. "This is our third year of operation with the dredge "Bold Venture" obtained from Ellicott in 1957," continues Mr. Mulbry. "By now we have been able to determine the value of obtaining a completely engineered dredging unit from a reputable company, rather than building one ourselves, or obtaining one from a less well established firm."

"We are more than satisfied with the production and operation of our Ellicott 'DRAGON' Dredge. It is not only well engineered and accurately constructed, but easy and economical to operate. Our records show that *this purchase was the wisest decision we ever made*. Per dollar invested in the dredge and its operation, we are able to get about twice the land area pumped up as by other means. We estimate the *savings will be close to \$500,000* by the time the project is completed."

You can enjoy similar savings with an Ellicott "DRAGON" Model Dredge, designed and manufactured by a company now marking its 75th year in designing and building dredges and dredging equipment. Write for information to Ellicott Machine Corporation, 1605 Bush Street, Baltimore 30, Md.

2378

## ELLICOTT DREDGES

ELLICOTT MACHINE CORPORATION, Baltimore 30, Maryland, U.S.A.; Timberland-Ellicott, Limited, Woodstock, Ontario, Canada; Dragues Ellicott France, Paris, France; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott de Mexico, Mexico City, Mexico; Ellicott Fabricators, Inc., Baltimore, Maryland; McConway & Torley Corporation, Pittsburgh, Pennsylvania.

Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering, design and construction services.



## Sales and Service

*Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distribution, sales personnel and other activities.*

### Distributor Appointments

**Koehring Co.:** The Kwik-Mix Division has appointed Western Contractors Supply Co. of Melrose Park, Ill. as distributor for Ka-mo products.

**Highway Equipment Co.:** The following distributors have been appointed: Plains Machinery Co. of Lubbock, Tex.; Wilson Equipment and Supply Co. of Cheyenne, Wyoming; Cline Construction Equipment, Inc. of Kansas City, Mo.; Pecaut Equipment Co. of Sioux Falls, S. D.; Stephenson Equipment, Inc. of Harrisburg, Pa.; and Contractors Machinery Co. of San Francisco, Calif.

**A. M. Byers Co.:** Two new distributors have been appointed. They are: Hajoea Corp. of Trenton, N. J., and Mountain States Pipe and Supply Co. of Colorado Springs, Colo.

**McCulloch Corp.:** The company has announced a major re-alignment of distributorships in the state of California. Cliff McKnight, former McCulloch distributor in Eureka, has established the California-McCulloch Equipment Co. at Los Angeles and will serve as distributor for all McCulloch dealers in southern California. Concurrently, Kellogg-Little Co., McCulloch distributor in San Francisco, has taken over the Eureka operation.

**Westinghouse Air Brake Co.:** The Le Roi Division has appointed the following distributors for the S2 line of large stationary compressors. Chesapeake Supply and Equipment Corp.; Shamut Equipment Co. of Manchester, Conn.; Stewart Equipment Co. of Harrisburg, Wilkes-Barre, and Philadelphia, Pa.; and the Francis Wagner Co. of El Paso, Tex.

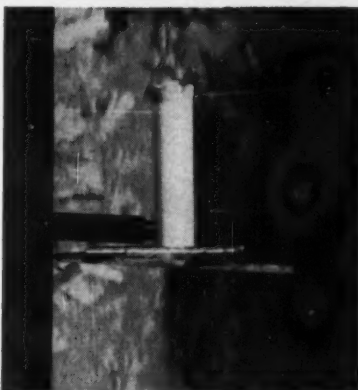
**LeTourneau - Westinghouse Co.:** The new firm of Buckhorn Equipment Co. of Cheyenne, Wyoming, has been appointed distributor for

# Birth Of A Blast

Many unique tools are used by Spencer Chemical Company in blasting research. For example, these exclusive photos, taken at intervals of seven millionths of a second by a special camera, record the detonation of a 4-lb. mixture of Spencer N-IV Ammonium Nitrate and fuel oil.

Research like this, conducted by Spencer's own staff, and sponsored by Spencer at leading U. S. research centers, results in new and better ways to use Spencer N-IV and fuel oil for blasting.

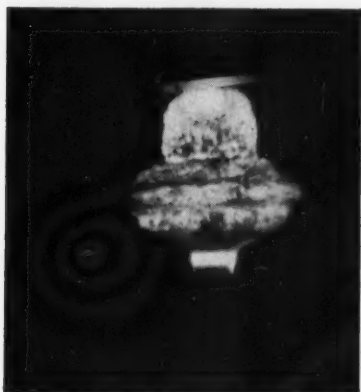
Spencer Chemical Company would like to share this knowledge with you. For information, use the coupon below.



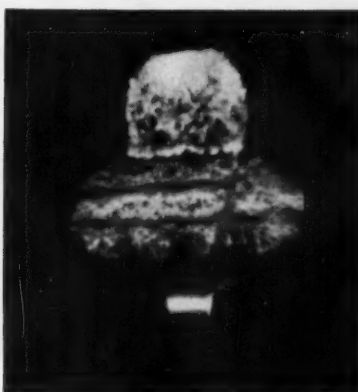
**2:13 P.M.** The 13"-long charge, containing 94% Spencer N-IV Ammonium Nitrate and 6% fuel oil is about to be detonated.



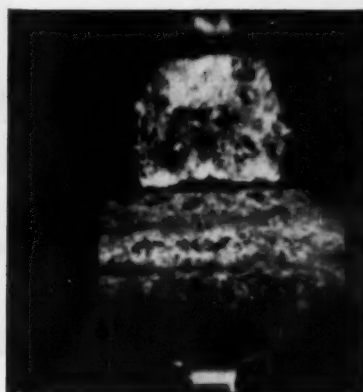
**2:13.000028 P.M.** The detonation wave has already spread over nearly one-third of the Spencer N-IV—fuel oil mixture.



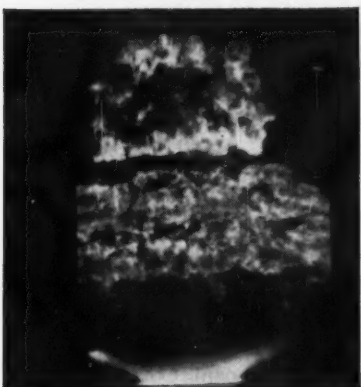
**2:13.000056 P.M.** This mighty, but controllable, energy is partly a result of N-IV's special structure and greater nitrogen content.



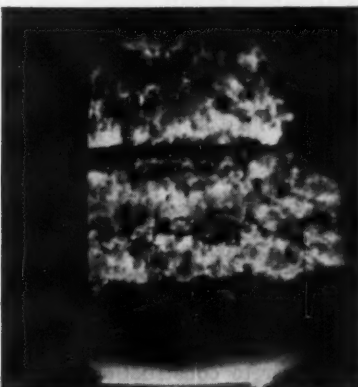
**2:13.000088 P.M.** Shown here is the great detonation velocity of the N-IV—fuel oil mixture. Yet, N-IV is safe to store and handle.



**2:13.000128 P.M.** The continuous and even release of energy shown here is a result of extensive Spencer research.



**2:13.000160 P.M.** Near maximum energy is now being released by the low-cost Spencer N-IV Ammonium Nitrate—fuel oil mixture.



**2:13.000184 P.M.** Full detonation! For information on how you can use Spencer N-IV Ammonium Nitrate, fill out, mail coupon at right.



Spencer Chemical Company  
409 Dwight Building  
Kansas City 5, Missouri

I want to know more about:

- ☐ Spencer N-IV Ammonium Nitrate as a blasting ingredient.  
☐ Spencer Powder Monkey.

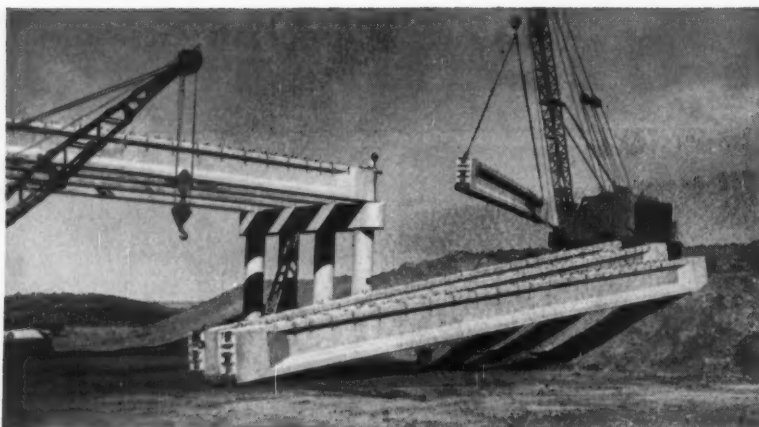
Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_





End span beams are 42' 7" long.  
All beams have a depth of 45".

Beam placement nears completion. Center span beams are 67' 8" long.



*Owner:*  
North Dakota Highway Department

*Contractor:*  
Otto J. Eickhof & Sons, Inc., Crookston, Minn.

*Manufacturer of Prestressed Beams:*  
Concrete Sectional Culvert Co., Fargo, N.D.

## Prestressed Concrete for NORTH DAKOTA BRIDGE

As the Interstate Highway program moves forward, an increasing percentage of its structures is being designed for prestressed concrete beams. The reasons: low first cost, minimum maintenance, fast, easy erection, and attractive appearance.

A recent example is this bridge over new Interstate Route 94 near Fargo, North Dakota. It is constructed of 16 prestressed I beams, eight of which are 67' 8" long; the other eight are 42' 7" long.

In the manufacture of these beams, Concrete Sectional Culvert Company used Lehigh Early Strength Cement for maximum production efficiency. Early removal of units and quick re-use of casting beds permitted a most economical casting cycle.

This is typical of the advantages of Lehigh Early Strength Cement in modern concrete construction. Lehigh Portland Cement Company, Allentown, Pa.



## LEHIGH CEMENTS



**SALES AND SERVICE . . .**  
*continued*

the complete line of LeTourneau-Westinghouse earthmoving equipment in the eastern and southern half of Wyoming.

**On the Sales Front**

**Harnischfeger Corp.:** The company is decentralizing its construction and mining equipment sales into three major U. S. sales regions. The regions and new managers for them are: William H. DeHuff, western region with headquarters in San Francisco; J. C. Huntington, Jr., central and southern region with headquarters in Milwaukee; and J. E. Laffrey, eastern region with headquarters in Teterboro, N. J. Kenneth A. Willig has been appointed national sales manager for a newly-formed small excavator division.

**Caterpillar Co.:** H. H. Howard, Caterpillar vice president in charge of the Engine Division, has announced the following organizational changes. Jack H. Gill, former engine sales manager, has been promoted to assist Mr. Howard in a staff position. Fred V. Jacobs moves from manager of Caterpillar Tractor Company's sales development division to become engine division sales manager. The sales department has been divided into three sections. Bob Cummings becomes manager of the manufacturers sales division; Hugh Rose becomes manager of Caterpillar dealer sales division; and Gene Sterrett becomes manager of sales development division.

**Bethlehem Steel Co.:** John G. White has been named general manager of sales for the Pacific Coast Division. He succeeds S. S. Cort, who has been named assistant general manager of sales for Bethlehem Steel Co.

**Curtiss-Wright Corp.:** Joseph Abbiez has been appointed general sales manager, construction machinery, of the South Bend Division. Mr. Abbiez has been active as product sales manager and technical sales manager since Curtiss-Wright's entry into the construction machinery field.

**L. B. Foster Co.:** The following sales representatives have been appointed: Frank K. Gunther, in



**Now!**  
**Cut costly stripping & resetting time with these**

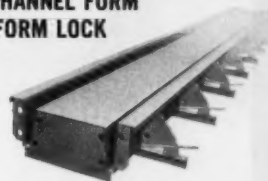
**NEW FORM HANDLING FRAME\***

Strips and repositions both side forms in one quick smooth action. Pulls and resets sections 50-foot or longer with ease.

**NEW *form-Crete* STEEL FORMS**

The new forms and handling frame shown on this page were developed for one specific reason—to help you cut your operating costs. Each feature, the form-locks, the tilt-back, and the handling frame was fully tested under working conditions for many months. In every test, the results were the same—faster stripping and resetting of forms. Get the full story. Clip the coupon below and ask your local Form-Crete man for full details.

**NEW CHANNEL FORM WITH FORM LOCK**



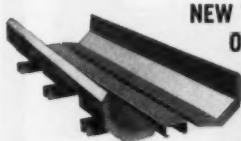
Locked in perfect alignment during casting operation, the sides of this form flex out when locks are released allowing quick removal of product.

**NEW SQUARE PILING FORM WITH FORM LOCK**



Form-Lock feature locks sides in perfect alignment for pouring. When locks are released, sides flex away from product for easy stripping.

\*Patents applied for



**NEW TILT-BACK OCTAGONAL PILING FORM**

Easily removed braces permit hinged form to swing away for quick removal of cast product.

PF-18



Putting Ideas to Work

**Form-Crete Department**

General Sales Offices:

Lakeland, Florida — Riverside, California

**FOOD MACHINERY AND CHEMICAL CORPORATION**  
**FORM-CRETE Department** Dept. FC1  
LAKELAND, FLA. • RIVERSIDE, CALIF.

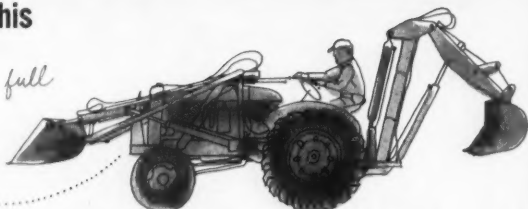
Please send me your latest catalog giving full details on your new Form-Crete Forms.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

## SCHRAMM HEAVY PNEUMATRACTOR GIVES YOU COMPRESSED AIR ON A TRACTOR!

### 1 like this

*Schramm full  
125 cfm  
compressor  
here*



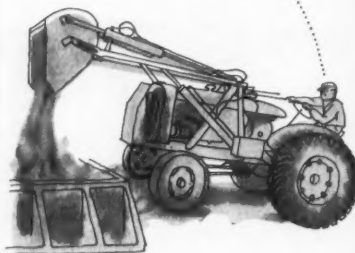
*plus... husky tractor with  
back-hoe and front end loader*

### 2 your tractor and operator are 100% self-sufficient

*operator can break  
out concrete, tamp,  
drill = do any job  
with compressed air*



*same man can dig,  
scrape, haul, grade,  
fill... etc... etc...*



### and here are doodles on what you save

Tractor.....	\$ 3,600
Loader.....	\$ 2,250
Backhoe.....	\$ 3,900
Schramm 125 cfm Compressor..	\$ 3,720
	<b>\$13,470</b>

*if bought separately  
at average prices*

Schramm Heavy Pneumatractor  
... \$12,421.50



Write for Catalog 5740. And see your nearest Schramm Dealer listed in the Yellow Pages.

## Schramm PNEUMATRACTORS

604 North Garfield Ave., West Chester, Pa.

Schramm, Inc., manufacturers of Rotadrills (Pneumatractor Mounted, Truck Mounted, Crawler Mounted), Air Compressors (Portable, Stationary), Self-propelled Air Compressors (Pneumatractors) and Booster Compressors

## SALES AND SERVICE . . . *continued*

the Pittsburgh office, will specialize in sales of rail and track accessories; Philip G. Hughes, in the Pittsburgh office, will handle the company's line of construction products; and William J. Bedford has been assigned to the Los Angeles office.

### In the Main Office

**Cincinnati Rubber Mfg. Co.:** William V. Shakespeare has been appointed president of the company to succeed L. P. Darnell, who has retired.

**Borg-Warner Corp.:** Arthur J. Welch has been elected president and general manager of the Spring Division. He succeeds Harry P. Troendly, who was advanced to the Divisions supervisory board.

**Joy Mfg Co.:** Herman Van Houten has been elected vice president and general manager of the Mining and Construction Division.

**General Motors Corp.:** Harold H. Dice has been appointed general manager of the Allison Division.

**Hewitt-Robins, Inc.:** E. J. Mytkowicz has been appointed to the newly created position of vice president in charge of operations of the Hewitt Rubber Division.

### Associations

**Construction Industry Manufacturers Association:** The following offices were elected at a recent annual meeting: president, Don Bittenheim, of Bittenheim Publishing Co.; first vice president, A. J. Lichtinger, of Wellman Engineering Co.; second vice president, W. C. Cox, of Caterpillar Tractor Co.; and treasurer, W. A. Nugent, of Thor Power Tool Co.

### Special Mention:

**Acrow Co.:** Acrow has acquired the issued capital of Thos. Storey (Engineers) Ltd., manufacturers and exporters of Bailey bridging and Uni-Flote equipment.

**Stenberg Mfg. Corp.:** The company has announced that it is now conducting its business under the name of Flygt Corporation. The company manufactures and distributes the Flygt line of electric submersible pumps.



New Model H-120 Hough "PAYLOADER" built to scoop 20% more load because of the great strength of USS MAN-TEN and "T-1" Steels.

## "T-1" and MAN-TEN Steels

### cut 1 ton of dead weight from this bigger **PAYLOADER**®

Two thousand pounds of weight have been chopped from the front end of this new Hough H-120 "PAYLOADER" by designing with USS "T-1" and USS High-Strength Steels. Result: one ton more capacity . . . increased reach and dumping height . . . better balance . . . stronger construction . . . lower operating costs.

This is another case where the greater tensile properties of the high-strength steels and the *extra* high strength of USS "T-1" Steel (100,000 psi minimum yield strength) made possible a superior designed machine. About 4,000 pounds of USS "T-1" Constructional Alloy Steel in  $\frac{1}{2}$ " and  $\frac{3}{4}$ " plate and  $\frac{1}{2}$ " x 5" bars are used in the boom arms, rocker arms, and bucket attachment brackets. The bucket is  $\frac{5}{16}$ " USS MAN-TEN Brand High-Strength Steel—a 50,000 psi minimum yield point grade.

The bucket lift assembly was designed to a working stress, which, multiplied by a reasonable safety factor,

USS, "T-1" and MAN-TEN are registered trademarks of United States Steel. "PAYLOADER" is a registered trademark of The Frank G. Hough Co.

comes up to the full minimum yield strength of "T-1" Steel. The 2,000 pounds of weight saved went directly into increased payload capacity—20%. The new "PAYLOADER" can handle 12,000 pounds instead of the 10,000 pounds of the experimental design. This is just what the customers wanted. No other steel offered such a high ratio of strength to weight.

The first 150 of these Hough tractor shovels are already giving outstanding service. More are being built. The combination of USS "T-1" and MAN-TEN Steels in the new "PAYLOADER" provides high strength with low total cost, lighter weight and freedom from maintenance.

For more information on any of these USS special steels, write to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

The Frank G. Hough Co. is a subsidiary of International Harvester Co.

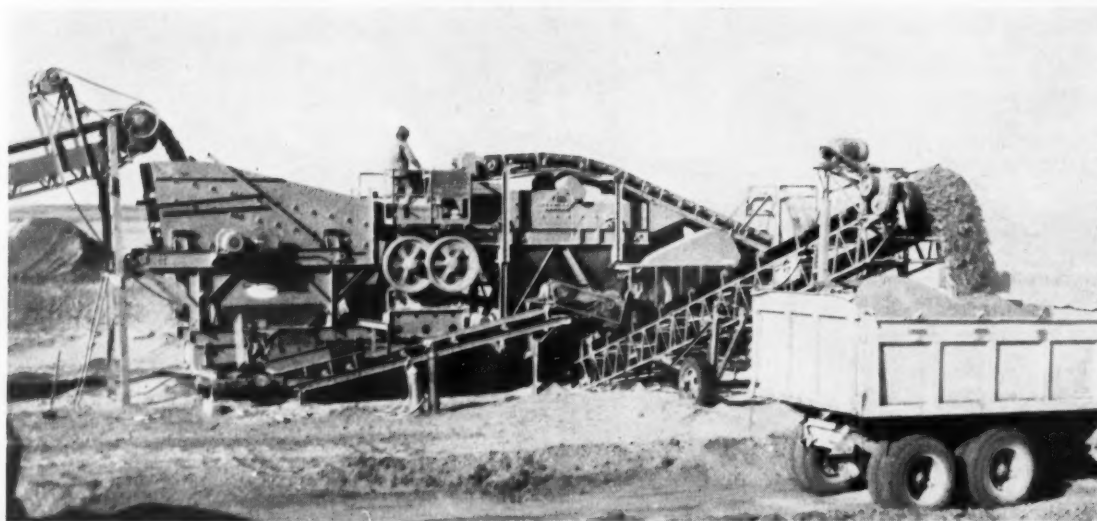
United States Steel Corporation—Pittsburgh  
Columbia-Geneva Steel—San Francisco  
National Tube—Pittsburgh  
Tennessee Coal & Iron—Fairfield, Alabama  
United States Steel Supply—Steel Service Centers  
United States Steel Export Company

**United States Steel**





## Construction Equipment News...



### Gravel Plant Produces Four Grades of Material

A portable, one-man-operated, primary and secondary gravel plant can deliver 700 tph of 1-in. minus material. The Universal Gravelking plant produces four grades of material—pit run sand, pit run gravel, 100% crushed gravel, and crusher dust. Combinations of these products can be made by blending them on the conveyors.

A 13x36-in. matched jaw crusher boosts primary crushing capacity and helps maintain the plant's high output. An inclined gyrating scalping screen handles all initial screening. It is a 4x12-ft, 2 2/3-deck unit that feeds only oversize material to the

crusher, bypassing sized pit run and sand immediately and taking the load off the secondary equipment. The Universal 4x12-ft, 2 1/2-deck Screenmaster with a phasing bar-air spring combination takes care of final sizing.

The Gravelking is available with a triple running gear to keep axle loads to a minimum. Its scalping screen and the jaw crusher are individually skid-mounted for easier transportation. Additional loading hoppers, feeders, and conveyors are available for various feeding methods.—Universal Engineering Corp., Cedar Rapids, Iowa.

### Two Engines Power Big Excavator, New Type Controls Operate It

One engine supplies power for swing and travel, and another powers the drums on the Manitowoc 4500 Vicon excavator. The rig can work as a 6-yd shovel or as a 7-yd dragline.

New type controls eliminate throttles and brakes and simplify the unit's operation. Each clutch control lever is also a throttle. To engage a clutch, the lever is simply pushed or pulled from its dead center or stop position; the farther the lever is moved in the direction of the machine's operating motion, the faster the machine works. Clutch slippage is at a minimum because the first 10 deg of lever movement engages the clutch but does not activate the throttle. Additional movement of the control lever accelerates the machine.

The machine's three-stage torque converter eliminates brakes. When the boom is swinging in one direction, it can be accelerated in the opposite direction for the return swing without the need for braking.—Manitowoc Eng. Corp., Manitowoc, Wis.







### **Small Vibratory Roller Also Handles Dead Weight Rolling**

The Littleford 125-V Vibra-Topper produces 2,600 lb of compaction thrust—more compaction density than an 8-ton dead weight roller.

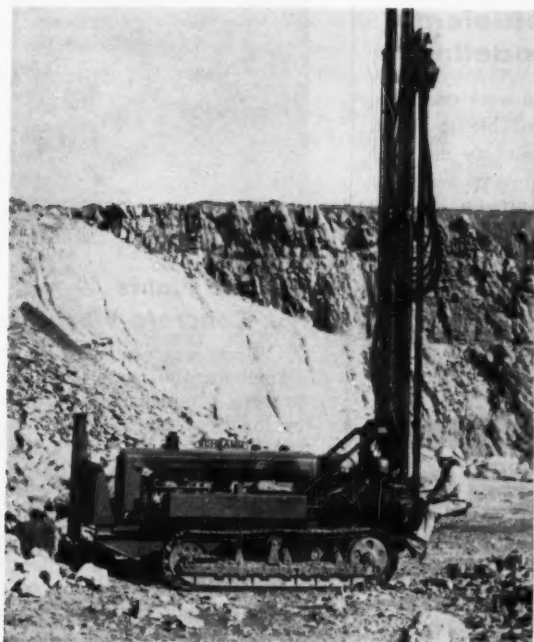
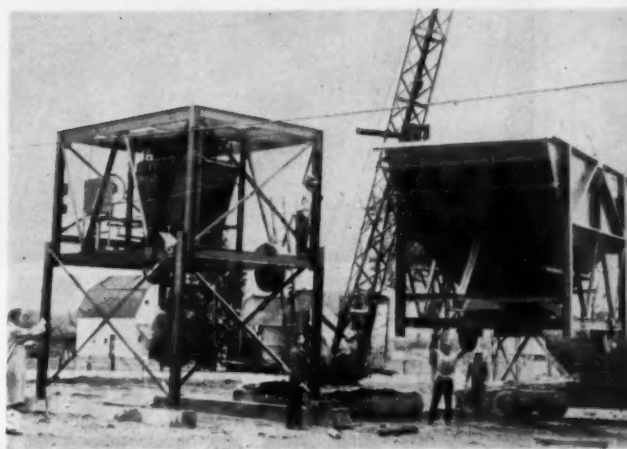
A separate clutch controls the vibratory portion of the unit. This feature permits it to work as a 1-ton static roller for asphalt or as an 8-ton vibratory unit for base compaction. — Littleford Bros., Inc., 457 E. Pearl St., Cincinnati 2, Ohio.

### **Push-Button Batch Plants on Wheels**

Built-in wheels and towing tongues simplify transportation of the Heltzel 100 and 150-ton batch plants. The push-button-operated plants can produce two batches in 13 sec.

Each of the plants breaks down into two mobile sections for transportation. The hopper makes up one trailer, and the batcher—including scales and fold-up supporting columns—makes up the other.

During erection, the batcher section is raised into position first, and the hinged columns are lowered and bolted into place. Then the bin section is positioned and bolted on top of the batcher, completing the erection.—Flexible Road Joint Machine Co., Warren, Ohio.



### **Hydraulic Power Operates Drill Rig**

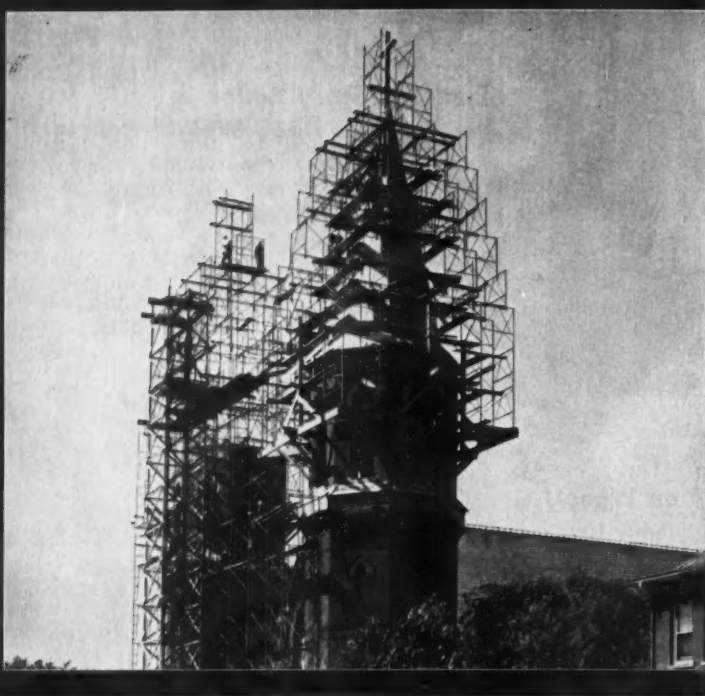
All controls on the Schramm C42 crawler Rotadrill are hydraulically operated. Also, each crawler track is independently driven by its own hydraulic motor; a variable speed hydraulic motor powers the top drive rotation head. To produce a down pressure of 12,670 lb, a hydraulic pressure of 1,500 psi can be applied to the hydraulic ram in the mast.

The C42 is designed for one-man operation. All controls for drilling and driving are in front of a sulky seat mounted at the drilling station. The operator can drill to a depth of 20 ft without leaving the seat.

A drill steel rack mounted on the mast holds two additional lengths for use on deeper holes. The standard machine is equipped with enough drill steel for a 60-ft-deep hole.

An air compressor on the drill rig produces 250 cfm of 100-psi air. With 3¾-in. drill steel, the C42 can drill 4½-in. holes to a depth of 300 ft. Maximum depth with 2⅝-in. drill steel is 500 ft. Average penetration rate in limestone is 12 to 15 fph.—Schramm, Inc., 900 E. Virginia., West Chester, Pa.

fit **EVERY** job condition!



# SAFWAY SCAFFOLDS

locate work platforms for efficient construction, repairs and remodeling

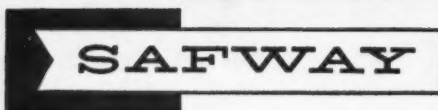
**SCAFFOLD EVERY JOB WITH SAFWAY** for efficient work and safe, speedy completion! Standard Safway parts are available to fit all special job requirements—let you mount platforms at exactly the right spot...and with ideal working conditions assured, you gain an important bidding advantage on all kinds of work—**routine or difficult, exterior or interior, large or small.** Here's how Safway helps you:

**EASY TO HANDLE**—Balanced frames for one-man handling. Compact stacking for shipping and storage.

**COMPLETE LINE**—Standard equipment will provide platforms of any shape—at any height—from any base.

**TOOL-LESS ASSEMBLY**—Frames assemble with coupling pins. Braces mount on wing-nut studs or Quick-Lock fasteners.

**SOLD AND RENTED**—Ample stocks at Safway dealers everywhere. Planning and erection service are available.



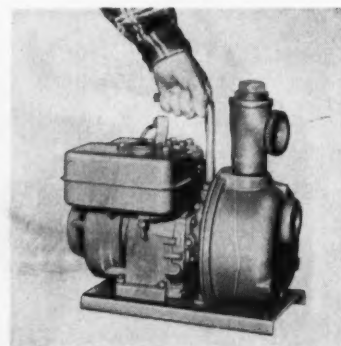
SAFWAY STEEL PRODUCTS, INC.  
6228 W. STATE ST., MILWAUKEE 13, WIS.

WRITE

FOR  
BULLETIN  
14A



EQUIPMENT NEWS...continued



## Lightweight Pumps

Largest of a line of pumps built by Construction Machinery is a 3-in. unit that weighs only 97 lb but can pump 19,000 gal of water per hr, according to the manufacturer. Smallest of the four models is a 1½-in. unit.

The pump impeller and volute are made of cast iron, but the pump body and engine are aluminum. Briggs & Stratton engines power all models. The pumps are self-priming and can handle either suction lift or booster pumping.—**Construction Machinery Co., Waterloo, Iowa.**



## Electric Plants For Concrete Vibrators

A Winco engine generator, designed for 180-cycle concrete vibrators, produces 2,500 w of 180-cycle, three-phase 230-v ac current. Also, it can supply 1,500 w of 110-v dc power for lights and power tools.

A Briggs & Stratton four-cycle engine powers the electric plant. It is equipped with a control that adjusts the speed for low or high slump concrete. — **Wincharger Corp., Sioux City 2, Iowa.**



**90 SECONDS  
FROM TRUCK TO SLAB!**

That's how fast you place 5½ cu. yds. of concrete with the

## **MAXON DUMPCRETE SPREADER**

60 seconds to chute-load the spreader bucket with the fast, flexible Dumpcrete hauling body—15 seconds to spread—15 seconds to move and strike off. Only 90 seconds completes the cycle. Placing rate ranges from 180 to 260 cu. yds. per hour, depending on plant capacity.

Dumpcrete Spreaders place to desired depth; base course, top course or full depth. Widths are adjustable from 11 to 25 feet. Controls are *hydraulic*. Design is simple and trouble-free. Construction is rugged. Applications include highways, airport runways, streets. And Dumpcrete Spreaders handle concrete of the lowest workable slumps.


Maxon developed this new spreader so that contractors could take full advantage of the time and labor-saving benefits of the "central mixing—non-agitated hauling" method. The Dumpcrete Spreader with Dumpcrete Trucks make a high-production team that's been job-proved by some of the nation's top contractors during the past season.

Get full details now. Find out how the complete Dumpcrete method can help you speed work, cut costs and maintain quality on your next paving job. Send the coupon today for new catalogs—or call your Dumpcrete distributor.

**Send for this new**

**Dumpcrete Literature**

**MAXON**  
MANUFACTURING DIVISION



**MAXON CONSTRUCTION COMPANY, Inc.**  
Manufacturing Division C-4, • 2600 Far Hills, Dayton 19, Ohio

Please send me the new Dumpcrete Spreader catalog with specifications

NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
FIRM \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



### **Big Capacity Crane Gets Under Low Clearances**

A large diameter, wide roller path and an extra strong king pin eliminate the need for hook rollers on the Manitowoc 3400 crane. Elimination of the hook rollers reduces overhead clearance heights about 9 in. The crane's gantry can be lowered without removing the boom to reduce the height even further.

Rated capacity of the crane is 65 tons. It converts to a dragline, shovel, hoe, or clamshell. Standard equipment includes a torque converter drive, independent double-drum boom hoist, and jack adjustment of crawler tension. A third drum for pile driving and a removable counterweight are optional.—Manitowoc Engineering Co., Manitowoc, Wis.



### **Single Rotor Impact Crushers**

Rogers impact crushers are equipped with a single rotor and can produce 250 to 1,200 tph. A specially designed lower chamber permits any large piece of material passing the feed opening to be crushed without bridging. According to the manufacturer, these crushers also can handle feeds containing a large proportion of mud.

The single rotor impact crushers are available with 38x50, 46x54, and 56x60-in. feed openings. A choice of portable, semi-portable, or stationary units is offered.—Rogers Iron Works Co., Joplin, Mo.

### **Small Tractor Shovel Joins Payloader Line**

Operating capacity of the Hough H-30 Payloader is 3,000 lb; it is equipped with a 1-yd bucket. Clearance under the cutting edge with bucket in the dump position is 8 ft 4 in. The bucket reaches 29 in. ahead of the front tires.

A gasoline engine, rated at 77½ hp, powers the four-wheel-drive tractor shovel. It is equipped with a torque converter and a power shift transmission with three speed ranges in each direction. A lever in the operator's compartment disengages the steering axle drive for highway travel. Two pedals control the brakes—one operates the four-wheel hydraulic brakes; the other controls the transmission.—The Frank G. Hough Co., Libertyville, Ill.

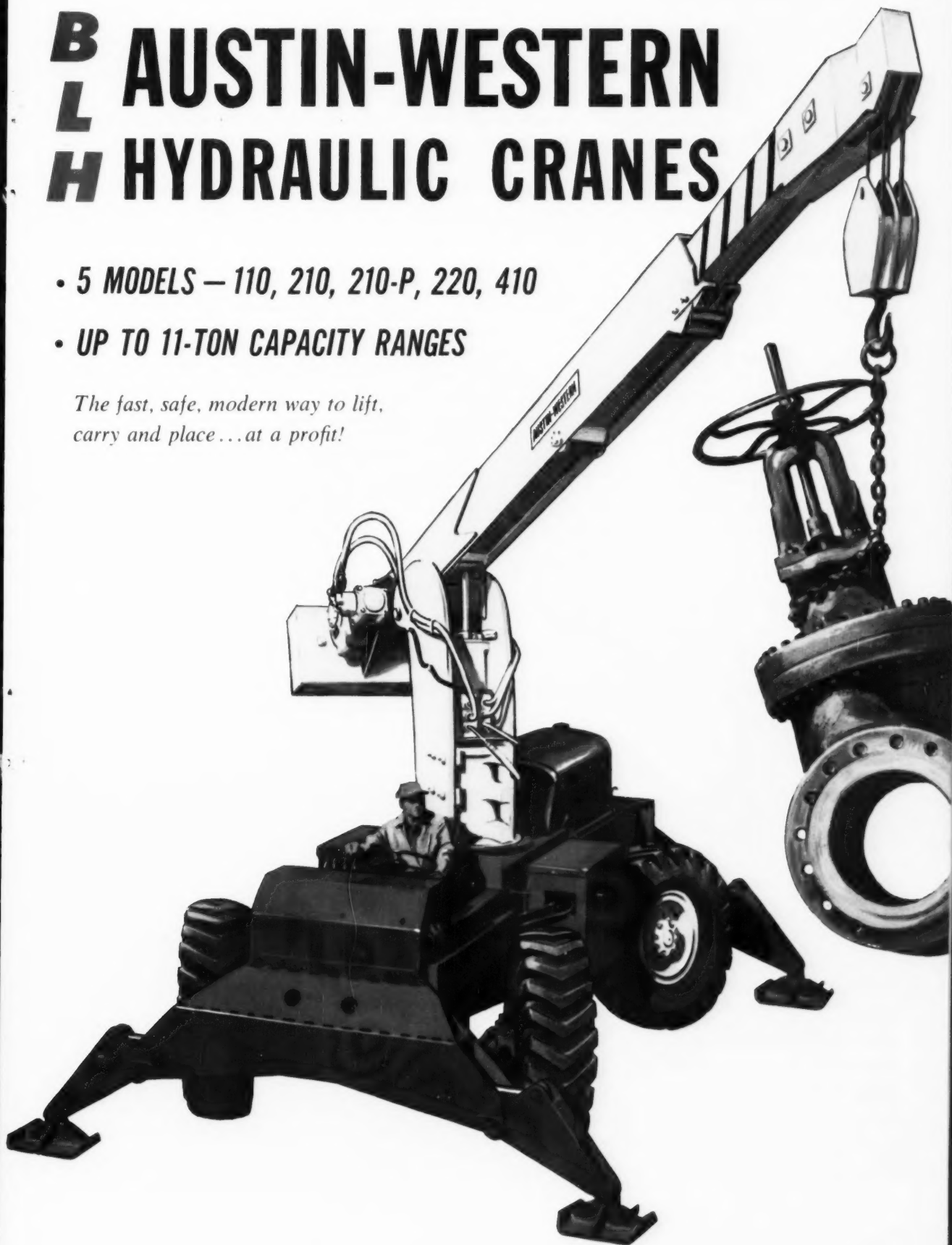




# **B L H** AUSTIN-WESTERN HYDRAULIC CRANES

- 5 MODELS — 110, 210, 210-P, 220, 410
- UP TO 11-TON CAPACITY RANGES

*The fast, safe, modern way to lift,  
carry and place...at a profit!*



# Austin-Western's telescoping delivers unequaled precision,

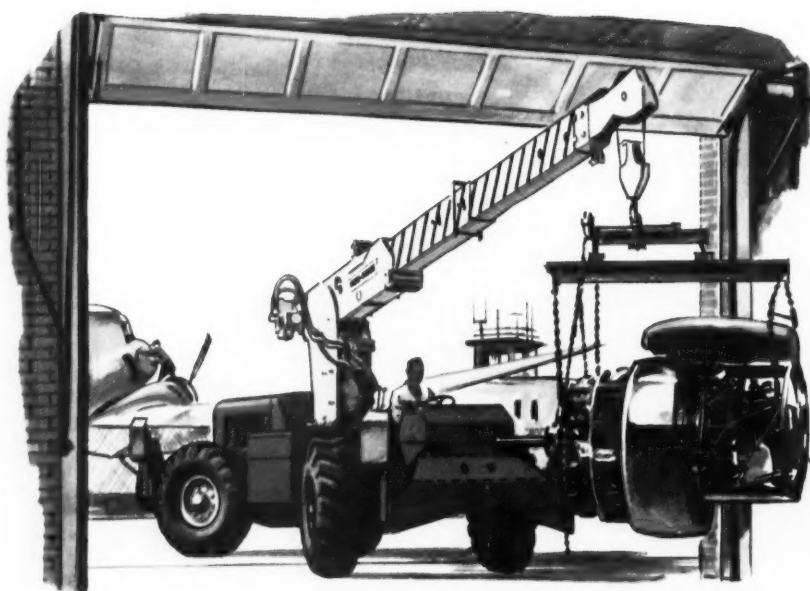
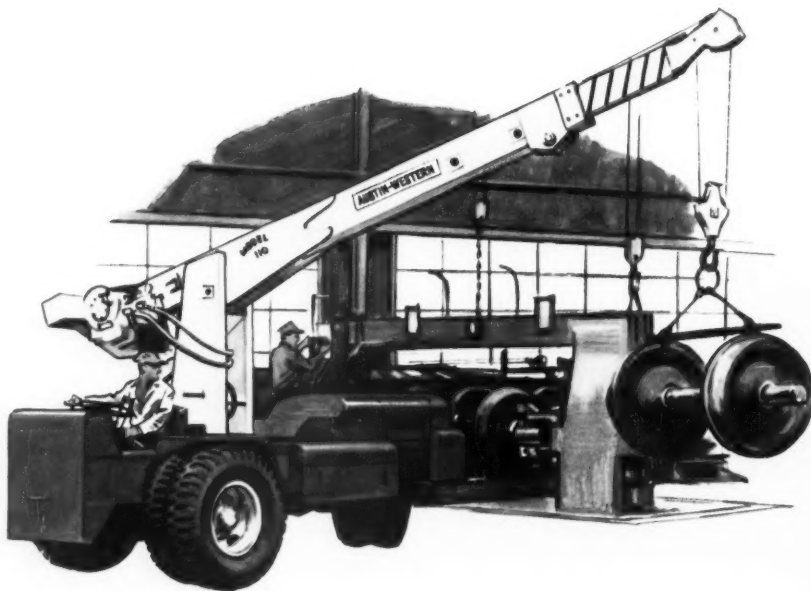
## MODEL 110

**5-ton range** — The 110 is the mighty midget of the A-W line—but what a midget! It'll outlift all other 3-wheel cranes over-the-side! It's industry's answer to fork truck limitations. The 110 has an 18 ft. 7 in. boom reach; 220° boom swing. Low 8 ft. 10 in. overhead clearance. Operates with ease in close quarters; handles loads in 5-ton range.

Features dual front driving wheels; dual tire rear trunnion power steer — road speeds from 2 to 18 mph. Torque converter and full hydraulic reversing mechanism standard. The unit can be tailored to your particular job needs with various combinations of features and equipment.

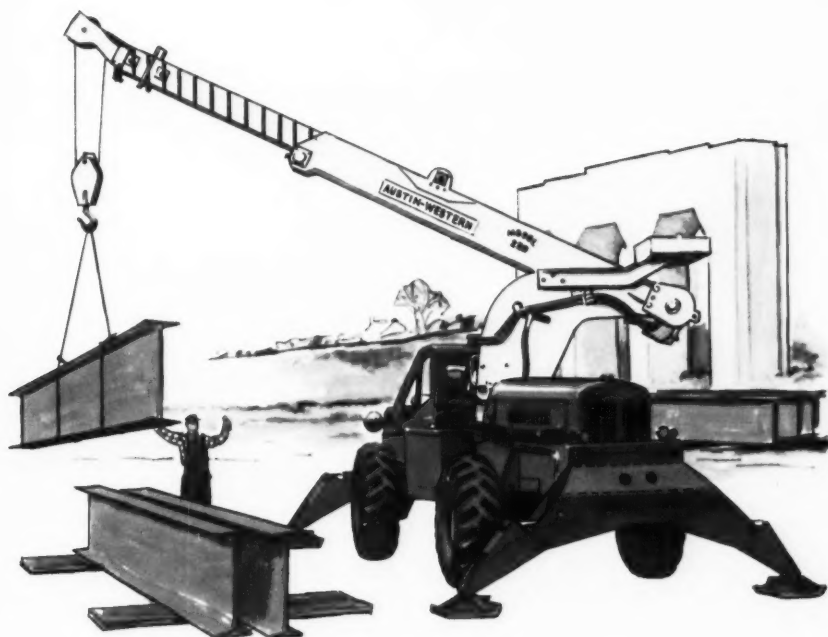
## MODEL 210

**7-ton range**—This basic model of the hydraulic crane line is rubber mounted, self-propelled; capable of road speeds up to 35mph. A real workhorse for an astounding variety of lift, carry and place assignments. 18-foot telescoping boom rotates in continuous full circle, maximum 35-foot boom reach optional. All-wheel steering gives unlimited maneuverability in tightest spots; all-wheel drive means plenty of traction for loaded boom travel on any surface. Low overhead clearance. Operation is fully hydraulic, including outriggers.



# live hydraulic boom safety, flexibility

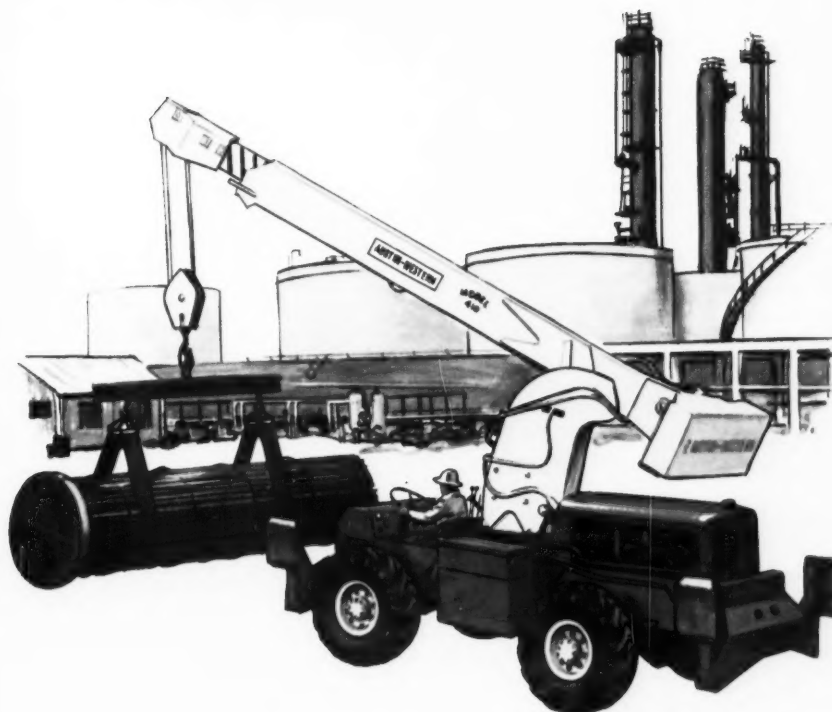
- Extends and retracts
- Raises and lowers
- Reaches up and in
- Reaches out and over
- Full hydraulic control
- Two or more movements with full boom load
- Continuous full circle rotation on most models



## MODEL 220

**8-ton range**—The Model 220 is a modified version of the basic Model 210. Its counterweighted boom as well as heavier structural design give it added lifting capacity into the 8-ton range. Like the 210, it features an 18-ft. telescoping boom, with maximum 35-ft. boom reach optional; continuous full circle swing; all-wheel drive and all-wheel steering. Full hydraulic controls mean tops in precision, safety, ease of operation.

## MODEL 410



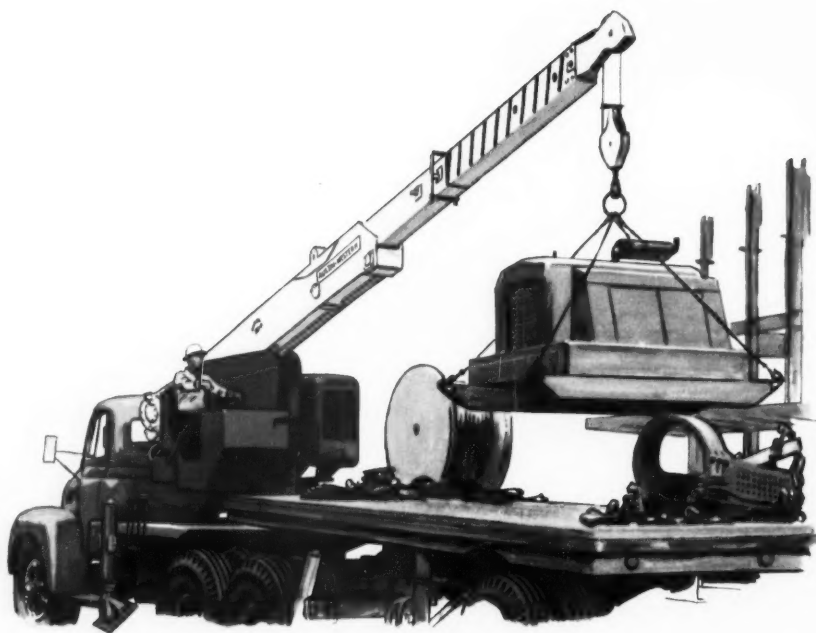
**11-ton range** — This big brute, the Model 410, is the heavy-duty unit in the A-W crane line. Like the 210 and 220, it is self-propelled; 25-ft. telescoping boom rotates in continuous full circle with maximum 48-ft. boom reach optional; raises to a 60° angle from horizontal.

Gas or diesel power; all-wheel drive and all-wheel steer are available. Travels from job to job at road speeds to 30 mph. This rugged, mobile crane is the rig for you if you need big crane capacity without sacrificing the profitable advantages of flexibility, versatility and mobility inherent in all models of Austin-Western hydraulic cranes.

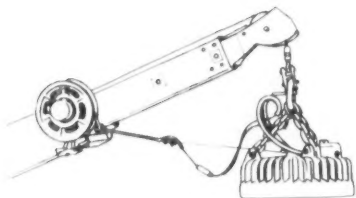
# MODEL 210-P

FOR TRUCK OR STATIONARY MOUNTING

**7-ton range**—The Model 210-P is the famous Austin-Western live 210 hydraulic boom . . . available as a package unit for truck or stationary mounting. Its 18-ft. telescoping boom rotates in a continuous circle; maximum 35-foot boom reach optional; lift capacity is in the 7-ton range. Can't be beat for crane applications requiring a high degree of mobility. This unit, like all other A-W cranes, can be equipped with a wide variety of attachments for extra versatility—such as clamshell, orange peel, maintenance platform, etc.

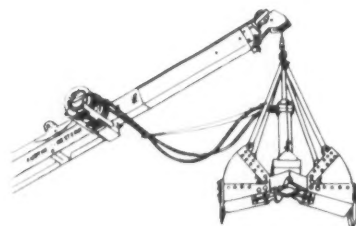
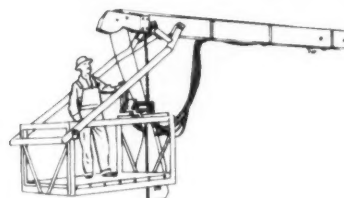


## FOR GREATER VERSATILITY—A WIDE CHOICE OF OPTIONAL ATTACHMENTS AND EQUIPMENT



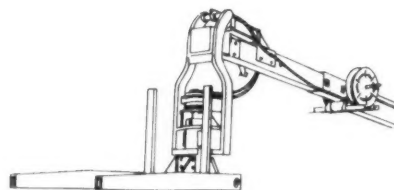
MAGNET

REMOTE  
CONTROL  
MAINTENANCE  
PLATFORM



CLAMSHELL  
BUCKET

LIFT FORK



Also available for most models:  
Orange Peel Bucket  
Cab  
Snow Plow

Rail Guide Wheels  
Hydraulic Outriggers  
Power Take-Off  
Load Carrying Platform

Winch  
Bulldozer Blade  
Manual Boom Extensions  
Pintle Hook

Learn the facts today about the A-W crane best suited to profitably perform your lift, carry or place requirements!

### Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

AD-2525

PRINTED IN U.S.A.







Portable Lima Austin-Western 101-SE crushing plant spews pit-run stone and gravel into mobile surge bin.

*Lima A-W Portable Crushers deliver*

## RELIABLE HIGH OUTPUT!

Designed and built for high output under *rugged* operating conditions, this portable Lima Austin-Western crushing plant is *ready* to pick up and go on a moment's notice. It belongs to the Williams Brothers Asphalt Paving Company, Ionia, Mich.

### **Reduced tonnage costs**

They say, "It's a reliable high-output mobile rig that's been doing a very dependable job for us in widely separated locations throughout southern Michigan."

"It's not a complicated piece of equipment. Only minimum maintenance has been required. It's easy to adjust to meet a wide range of rigid specifications in pit or quarry work. We find that the outfit's one man, central

control also helps us to reduce costs per ton."

The 101-SE is a completely portable, self-contained unit designed and built for rapid transport from job to job. High-speed production of construction materials near the job greatly reduces hauling time and costs.

### **Maintenance reduced**

Diesel power operates crushers and electric generator; all other operations are electric. Simplicity of transmission eliminates troublesome clutches, chains, sprockets and gearboxes . . . reduces maintenance, increases tonnage profits.

There's a portable or stationary Lima Austin-Western crushing and screening plant just right for your needs. Investi-

gate—see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



Stationary Installation—Lima A-W line includes jaw and roll crushers, matching screens, elevators, conveyors and bins.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA AUSTIN-WESTERN** Crushing, Screening and Washing Equipment  
**BALDWIN · LIMA · HAMILTON**  
 CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO



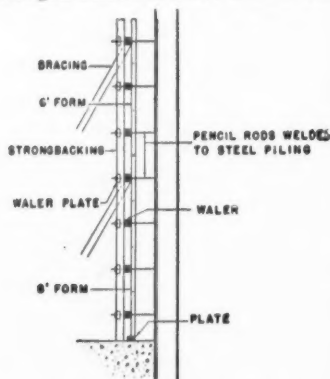
## 12¢ a Square Foot



### Best Method to Pour 750 Ft. Retaining Wall

#### Symons Forms, Sheet Piling and Pencil Rod Ties

How to pour a 750 foot lake retaining wall with thickness from 12 to 20 inches and 13 ft. high, faster and more economical. S. N. Nielsen Construction Company, Chicago, had that problem on a 600 unit apartment on Lake Michigan shoreline. Since a fixed core



could not be obtained while using sheet piling only, the superintendent used Symons Steel-Ply Forms with sheet piling and pencil rods as ties.

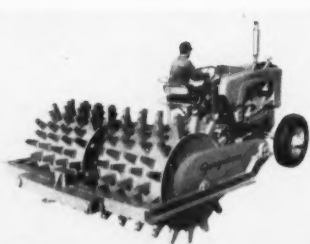
Was this method a success? After 250 feet of wall had been formed, poured and stripped, the forming costs were computed at 12 cents a square foot.

Contractors are finding almost as many uses for Symons Forms as there are jobs to bid on. It will pay you to send for our FREE form literature. And Symons Forms can be rented with purchase option.

**Symons**  
**SYMONS CLAMP & MFG. CO.**  
 4255 Diversey Ave., Dept. DO, Chicago 39, Ill.

\*MORE SAVINGS FROM SYMONS

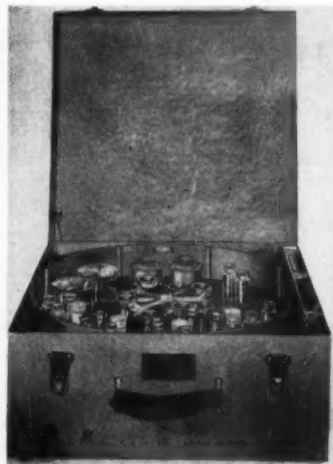
## EQUIPMENT NEWS...continued



### Self-Propelled Tamping Roller

This roller can operate equally well in forward or in reverse and, according to the manufacturer, saves an estimated 20% in time and operating costs because no time is wasted in turning around.

The Ferguson SP-112-48 self-propelled tamping roller can produce compaction pressures as high as 510 psi when fully ballasted. A 70-hp diesel engine drives the unit through a three-speed transmission.—Shovel Supply Co., P. O. Box 1369, Dallas 21, Tex.

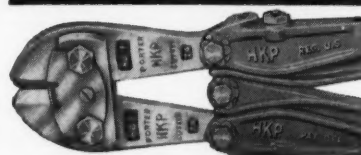


### Test Kit Checks Engine Oil on the Job

Engine crankcase oil can be tested for dilution and impurities on the job with a specially designed test kit. It shows when to change the oil or filter and when an engine needs attention because of fuel, water, or metal particles in the oil.

With the PK3 test kit, the operator can detect fuel dilution, water and antifreeze leakage, acidity, metal particles, dirt, or soot. — The Gerin Corp., Avon, N. J.

## THERE'S A



The PORTER CENTER-CUT CUTTER — in 6 sizes, for cutting up to 3/4". Our most popular tool. Ideal for general free cutting of soft and medium hard steel. Other models for HARDER METALS.

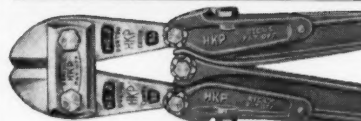


## PORTER CUTTER



The PORTER WORK-STATION CUTTER — in 3 sizes, up to 1/2" capacity. For continuous cutting operations it can increase the metal-cutting capacities of one man up to 300%! Saves time, work, money! Leaves one hand free to feed or hold material.

## FOR EVERY



The PORTER HEAVY DUTY CUTTER — in 3 sizes, up to 3/4" capacity. Specially designed for those rugged jobs in steel mills, construction companies and other heavy industries!

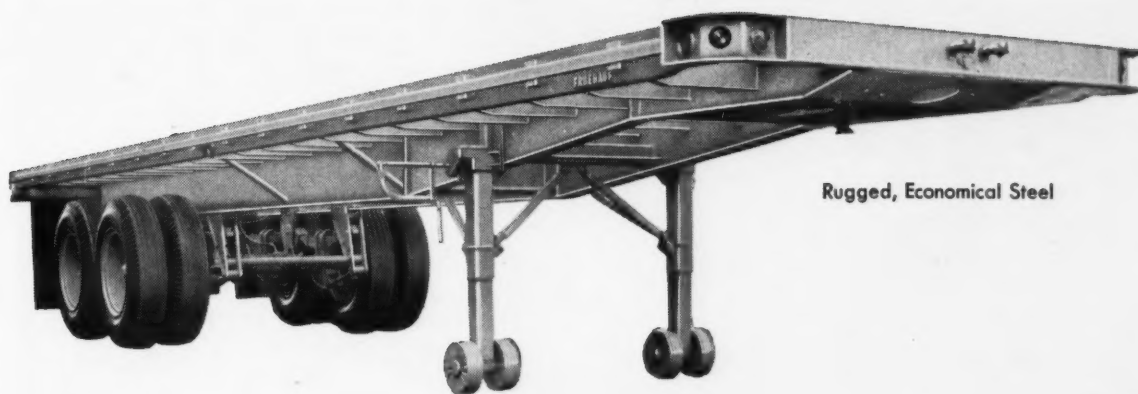
## METAL CUTTING JOB

SAVE TIME AND MONEY!  
 Over 100 Cutters in Various Sizes and Types — Hand or Power Operated

Contact your Industrial Distributor or write direct for your **FREE CATALOG!**

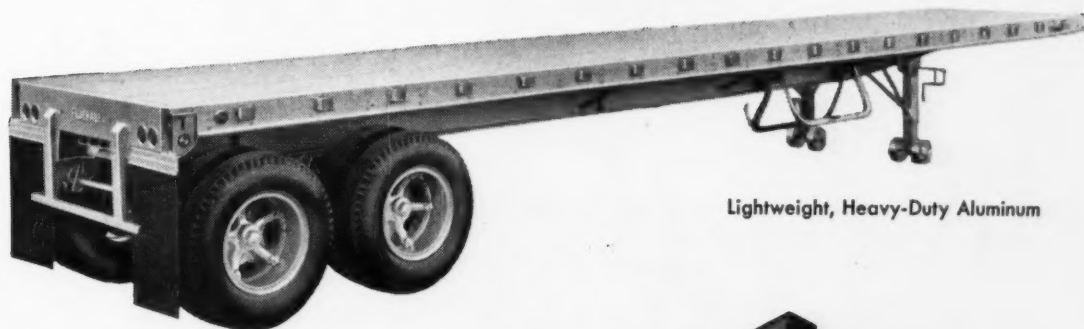
**CUT—**  
 up to 3/4" rods with HAND OPERATED TOOLS  
 up to 1 1/2" rods and 2 1/2" power cable with POWER OPERATED TOOLS.

**H. K. PORTER, inc.**  
 Somerville 43, Mass.



Rugged, Economical Steel

# TWO POWERFUL NEW LIGHTWEIGHT FRUEHAUF WORKHORSE PLATFORMS!



Lightweight, Heavy-Duty Aluminum

New ruggedness . . . New weight savings . . . New features . . . New interchangeability of steel and aluminum components—both crossmembers and side rails . . . Deep steel main members, deepest where the load is greatest . . . One-piece I-beam crossmembers fitting *through* the main frame—Integral rubrail . . . Recessed, protected lights of a new, impact-resistant design . . . New, lightweight, self-lubricating Square Leg 2-speed supports . . . Heavy duty aluminum or hardwood floors . . . Tapered stake pockets . . . Optional, independently removable aluminum racks with steel posts . . . Wide choice of economical, maintenance-free suspensions . . . The lightest weight platforms for their strength ever built!



For Forty-Six Years—World's Largest  
Builder Of Truck-Trailers!

## FRUEHAUF TRAILER COMPANY

10949 Harper Avenue • Detroit 32, Michigan

SEND THE FULL STORY ON THE AMAZINGLY STRONG,  
AMAZINGLY LIGHTWEIGHT NEW WORKHORSE PLAT-  
FORMS!

Name \_\_\_\_\_  
(Please Print)  
Company \_\_\_\_\_  
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City \_\_\_\_\_ State \_\_\_\_\_



## HAVE YOU SEEN "THE MAN WITH THE RED VALISE"?

Every Hercules Explosives technical representative carries "The Red Valise" you see above. In it are dummies of Hercules® Blasting Caps; with it in front of you, you and the Hercules man can determine the best materials for your specific requirements.

Talking with the Hercules man is always a

good idea. He's been expertly trained in his field, and backing him up is a complete line of quality materials for the industrial explosives user. You can always receive the help you need from Hercules, either by contacting the Hercules sales office nearest you or by writing direct to Wilmington.



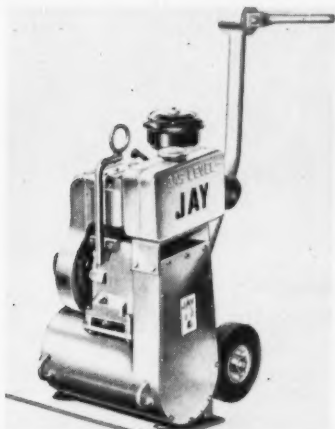
Explosives Department  
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XR60-3





### Improved Tampers

All three models of Jay tampers have been improved to increase the tamping force and operating speed. The manufacturer claims that these units are able to compact 100 cu yd of earth per hr in 6-in. lifts. Other improvements include a tubular loop handle attached to the tamper by a rubber shock mount that isolates the operator from vibration and large oil bath air cleaners.

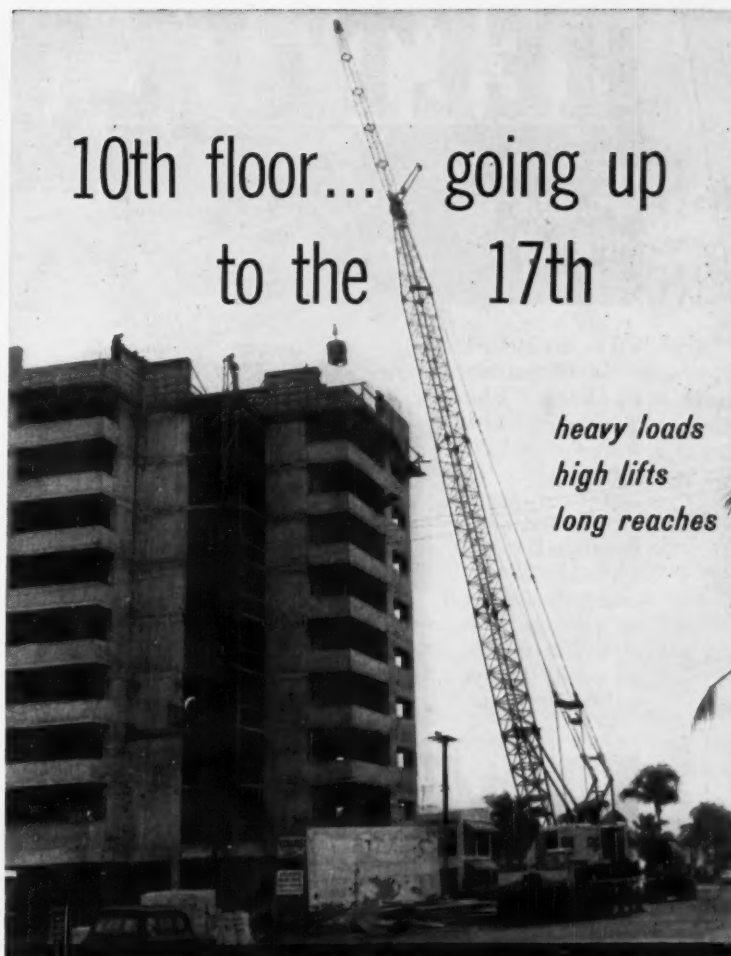
The three models can handle tamping plates ranging from a width of 13 in. on the smallest unit to 36 in. on the largest. All tampers are powered by 6.8-hp Wisconsin engines.—The Jay Co., Columbus, Ohio.



### Two-Way Radio

This three-channel, two-way radio is only slightly larger than a telephone and has a built-in loud-speaker. By interchanging the crystals, it can be made to operate on all 22 Citizens' Band channels. Its range over land is 6 to 8 mi, but over water it can cover a distance of 15 mi.

The Tele-Rad can operate on either 115-v ac or 6 or 12-v dc current with a power of 5 w.—Telephone & Electric Corp., 17 E. 42nd St., New York 17, N. Y.



● Building a new apartment in Fort Lauderdale, Fla., the Harrison Crane Service of Miami pours concrete and lifts materials with this Waukesha Engine powered P & H crane. Here at the 10th floor, crane has a 170-ft. boom. From here, up to the 17th floor top, boom will be 200 ft.

Waukeshas are standard for crane operation. This P & H crane is powered by Model 140-GK—4½ in. x 5½ in. bore and stroke; 525 cu. in. displ. Model 140 Series gasoline engines available up to 225 hp. Other models for crane or shovel installation, up to 1200 hp., Diesel or gasoline.

# WAUKESHA *powered*

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK

TULSA

LOS ANGELES

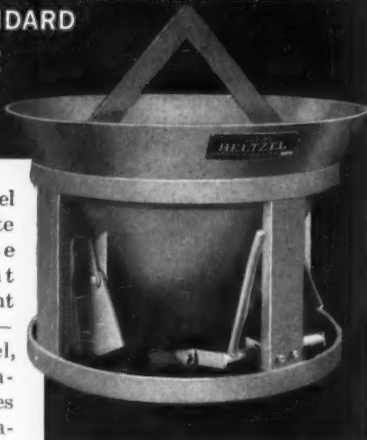
Factories — Waukesha, Wisconsin, and Clinton, Iowa

473

# HELTZEL

## NEW STANDARD CONCRETE BUCKETS

• The new Heltzel standard concrete bucket—"The heavy weight bucket at a light weight price"—features all-steel, all-welded construction. Handles all types of materials from grout to dry mix. Designed to assure an empty bucket with every pour.



- Steep hopper slopes
- Self-cleaning gates
- Accurate, adjustable discharge control
- Self-locking, double arc clam shell gates



HELTZEL STEEL FORM & IRON CO.  
WARREN, OHIO

## Small CRAWLER-TRACTOR INCREASES PROFITS!

- Backfills • Excavates • Grades
- Spreads • Drawbar 2000 pounds
- Size: 41" x 84"
- Lifts 7' x 3"



### MEAD **SPEEDCAT**

- (1) Operates in tight places where other equipment cannot be used!
- (2) Delivers power and traction proportionate to larger crawlers!
- (3) Can be operated or loaded on a pick-up truck or trailer by one man!

**Write for  
Literature or  
Demonstration**

MEAD SPECIALTIES CO., Dept. T-440, 4114 N. Knox Ave., Chicago 41

## EQUIPMENT NEWS...continued

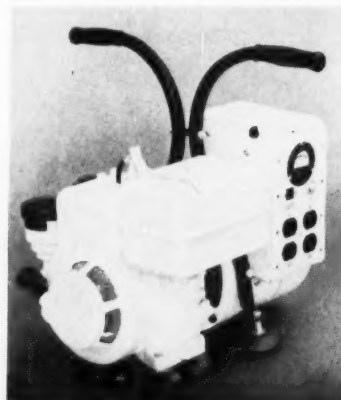


### Inflatable Shelter Goes Up in a Jiffy

Erection of this inflatable shelter requires only one man hour per 1,000 sq ft of area covered. The shelter can cover stored materials or protect personnel against adverse weather.

Inflated plastic tubes or air columns support the plastic tent. When deflated, it occupies a very small space and can be stored or transported easily.

All sides of the shelter can be enclosed to give protection against heat or cold. The shelter is available to span distances of over 100 ft.—Air Structures, Inc., P. O. Box 8217, Shreveport, La.



### Less Weight, More Horsepower

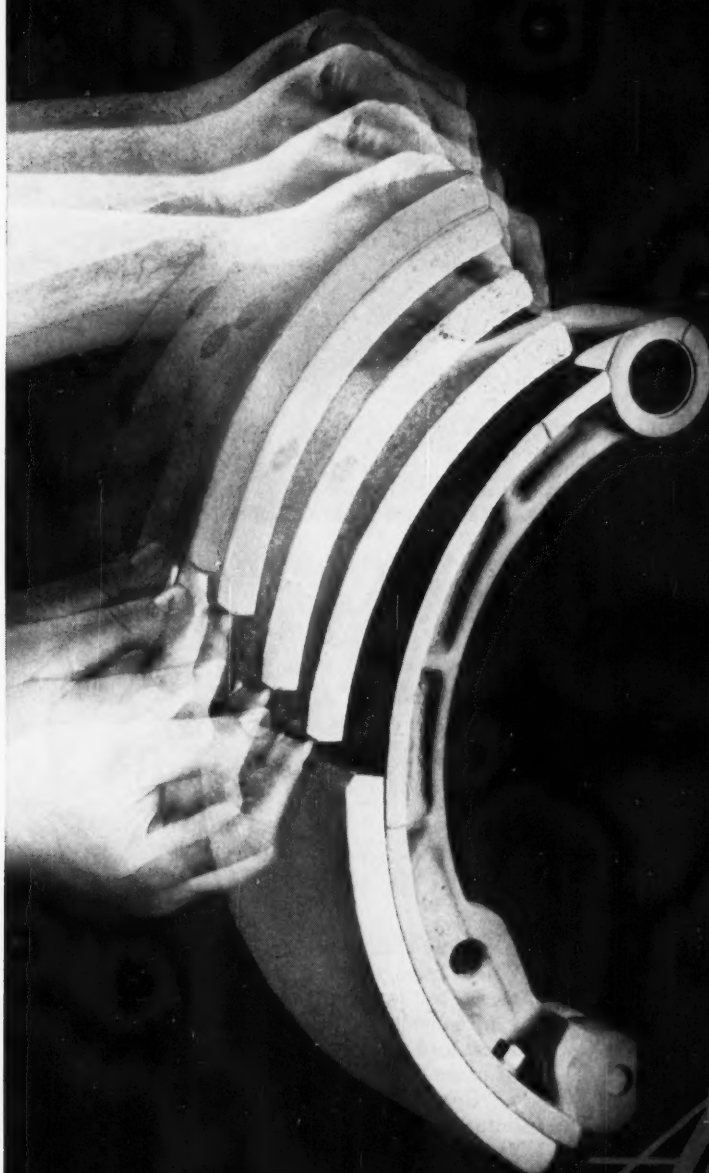
Redesigned Pacific Mercury electric plants weigh 25 lb less than previous models but have 10 more hp. The units are available in 1,750, 2,000, and 2,500-w capacities. The largest model weighs only 110 lb.

All three models are equipped with six electrical outlets for multiple operation of power tools. Other equipment includes electric starter, battery charger, rpm indicator, and cast aluminum skids.

—Pacific Mercury, 13232 Leadwell, North Hollywood, Calif.

What's it **costing**

**you**  
to reline **brakes?**



Want to save the \$1,000 or more brake jobs can cost you in a year? TORQMATIC DRIVE owners will tell you it's automatic with the built-in retarder, which also provides the added safety of another braking system.

For this optional TORQMATIC DRIVE feature saves service brakes for everything but full stops. Naturally linings last far longer... downgrade runs are safer.

TORQMATIC owners also report saving up to \$2,000 every time they train a new driver... eliminating one engine overhaul out of three... wiping out engine-disconnect clutch costs.

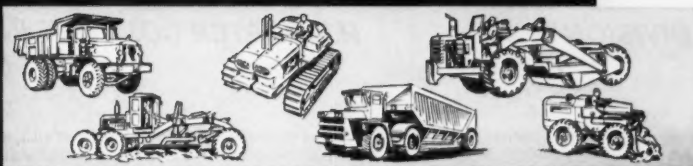
**Pays for itself in savings alone**

Sure you'll pay more for TORQMATIC — but you quickly get your money back in repair savings. And TORQMATIC also speeds job cycles—there's no need to slow down for shifts.

More and more operators are riding themselves of their clashbox-caused expenses by switching to TORQMATIC. It's been proved on years of tough jobs. Details? See your dealer or write Allison.

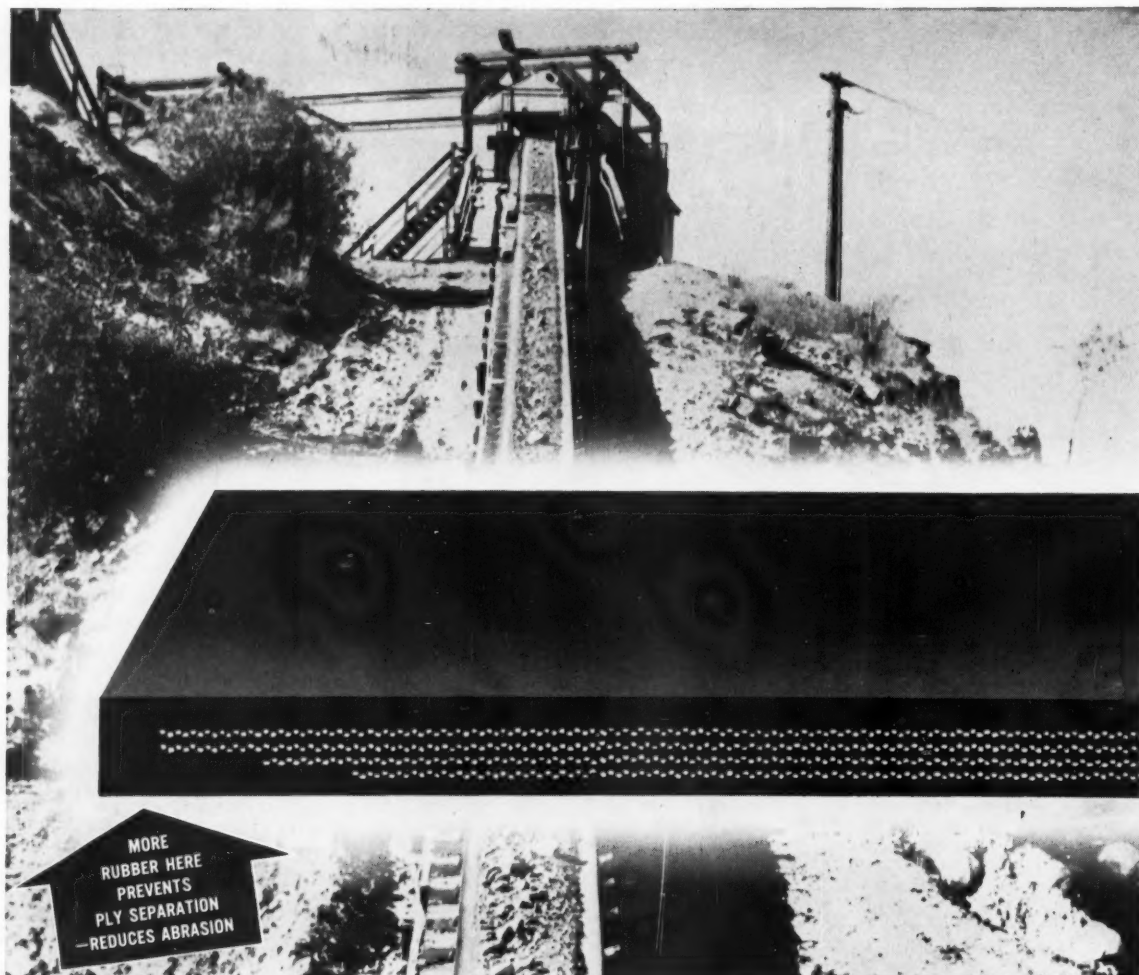
ALLISON DIVISION OF GENERAL MOTORS  
Indianapolis 6, Indiana  
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London, Ontario

*Allison* 



**TORQMATIC®  
DRIVES**

**THE MODERN DRIVE FOR  
MODERN EQUIPMENT**



## EXCLUSIVE "COLEDGE"\* CONSTRUCTION

gives **Thermoid** Conveyor Belting extra life where it counts

Unique "Coledge" construction puts more rubber *at the edges* where it's needed, prevents ply separation, makes a more flexible and wear resistant edge where abrasion is greatest. Punishment at the edges—especially the tough use dealt out in quarrying—can kill most conveyor belting in a fraction of the lifetime of Thermoid-Quaker belting.

Tests show Thermoid-Quaker "Coledge" construction lasts and lasts on the same jobs where other belting fails. "Coledge" construction is available on all grades

\*Patent Applied For

of Thermoid-Quaker belting.

What's more, all Thermoid-Quaker conveyor belting is prestressed in manufacture, so that the belt is actually in compression when you get it—ready for the heaviest load without strain.

Examine Thermoid-Quaker Belting with the exclusive "Coledge" construction at your Thermoid distributor's, or write for further information to Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Streets, Philadelphia 24, Pa.

**THERMOID DIVISION**



**H.K. PORTER COMPANY, INC.**

**PORTER SERVES INDUSTRY** with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.





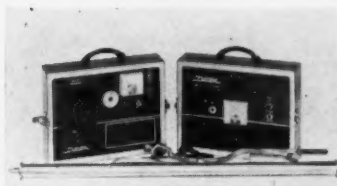
### White to Build Cook Bros. Trucks

White will manufacture and distribute nationally half-cab trucks previously built by Cook Bros. of Los Angeles for ready-mix and dump truck operations.

The trucks will be powered by White 185-hp engines. Standard transmission will be a five-speed unit with a four-speed auxiliary. Other components will include a variety of four-wheel-drive tandem axles with Hendrickson aluminum and rubber walking beam suspension, and a belt-driven fly-wheel power take off.—**The White Motor Co., 842 E. 79th St., Cleveland 1, Ohio.**

### Pipe Detector Works on Transistors

The Detectron 808 is a transistor pipe detector that can trace a 1-in. water pipe as deep as 10 ft. Maximum depth for detecting large pipes ranges from 20 to 25 ft depending upon soil conditions. The 808 traces pipes and cables by conduction and can operate in mineralized soils.



Special compensating circuitry makes this detector suitable for hot climate where heat instability of transistors has been a problem. Standard batteries operate the unit.—**Computer Measurements Co., 12970 Bradley Avenue, Sylmar, Calif.**



### Small Trailer Hauls Power Tampers

A small, welded tubular frame trailer is specially designed to carry any one of the three models of Jay power tampers. The trailer weighs 110 lb and rides on two rubber-tired wheels.

Accessories include a license bracket, combination tail and stop light, clamps for fastening tampers to the trailer frame, and a socket for a ball head trailer hitch.—**Jay Div., Leukart Machine Co., Columbus, Ohio.**



## WACO SCAFFOLDING for EVERY need

A wide variety of scaffold frames and accessories make Waco one of the easiest, most economical scaffolding systems to use. Outstanding accessories such as the #520 leg extension shown, save equipment and labor costs. Waco scaffolding is ideal for all construction, maintenance and shoring jobs. Check the Yellow Pages for your nearest Waco Distributor or . . .

**WRITE TODAY**  
for the complete Waco  
Scaffolding Story.



**WACO** Manufacturing Company

DIVISION OF WACO-PORTER CORPORATION  
5251 West 130th Street Cleveland 30, Ohio

Licenses: Armon Iron Works, Windsor, Ontario  
Tubular Structures Corp. of America, Los Angeles, California



Completely new design uses simple turbine wheel for power.

## **NEW VIBER TURBOVIBER®**

**Powerful, dependable,  
high speed, form vibrator  
for concrete casting yards**

**10,000 rpm.** Exerts over a ton of force.

**No motor lubrication.** No sliding friction. Minimum maintenance.

**Only one rotating assembly.** Long life.

**Always starts.** No vanes to stick.

**Drastically reduced operating costs.**

**Convenient mounting clamps** for easy attachment to any form.

*For additional information, see your Viber dealer or write  
Viber Company, 726 South Flower Street, Burbank 11, California.*



# **Viber Vibrators**

Pioneers and leaders in the manufacture of vibrators

## **EQUIPMENT NEWS...continued**



### **Four-Channel Radio**

The Commaire radio is an integrated receiver-transmitter with four separate channels that can operate throughout the entire 22-channel Class D Citizens Band.

The ED-27M Commaire is a single crystal receiver that works on a transistorized power supply. Its audio output is 4.5 watts. The unit sells for \$189.50.—**Vocaline Co. of America, Old Saybrook, Conn.**

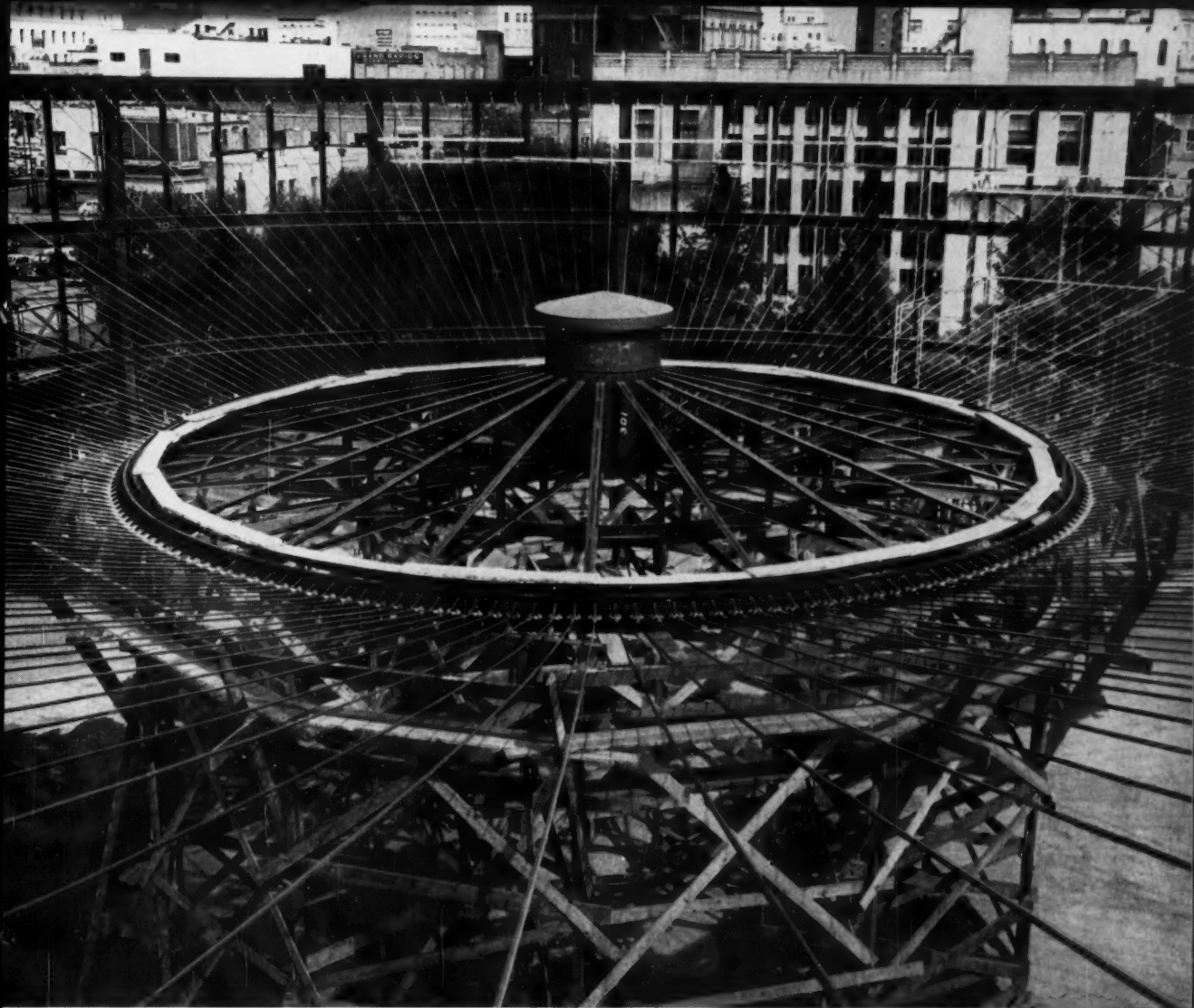


### **One Pedal Controls Forward and Reverse**

A single pedal, operated either by the heel or the toe, controls forward and reverse on the Minneapolis-Moline MoTrac crawler tractor. The full-power reversing shuttle frees the operator's hands for steering and controlling attached tools.

Either a 59-hp gasoline or a 53-hp diesel engine powers the tractor. Both engines are 4-cyl units built by Moline. Other power train components are a torque converter and a five-speed transmission. Maximum speed is 7.25 mph in forward or 9.07 mph in reverse.

The tracks have 2,086 sq in. of ground contact. Standard grouser are 14 in. wide, but 12 and 16-in. grousers are available also. The tractor mounts a 1¼-yd loader, dozer, backhoe, side boom, or winch.—**Minneapolis - Moline Co., Hopkins, Minn.**



*General Contractor: G. W. Mitchell; Architects: O'Neil, Ford and Associates, Nicanor Salas, project architect; Structural Engineer: W. E. Simpson Company; Steel Fabricator: Alamo Iron Works*

## Saucer-shaped roof in San Antonio supported by 200 Bethlehem Strand assemblies

Some Texans call it the Roundhouse . . . others refer to it as the Sombrero. It's the new Villita Assembly Building of the Public Service Board of San Antonio, and it's believed to be the only building of its kind in the United States. The circular structure will help promote San Antonio as a convention site.

The roof is supported by 200 Bethlehem bethanized strand assemblies. The assemblies consist of pre-stretched strands with swaged fittings, and turnbuckles. The pre-stretching limited the resid-

ual constructional stretch, and also raised the modulus of elasticity.

Bethlehem Strand is ideal for suspended-roofs, and other construction, because it provides maximum strength per unit of weight and diameter. Moreover, the bethanized coating of electrolytic zinc comes in three coating weights, for long-lasting protection against corrosion.

For full details about Bethlehem Strand, get in touch with the nearest Bethlehem sales office, or drop a line to us at Bethlehem, Pa.

**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**

*Export Distributor: Bethlehem Steel Export Corporation*

*Mill depots and distributors from coast to coast stock Bethlehem wire rope*



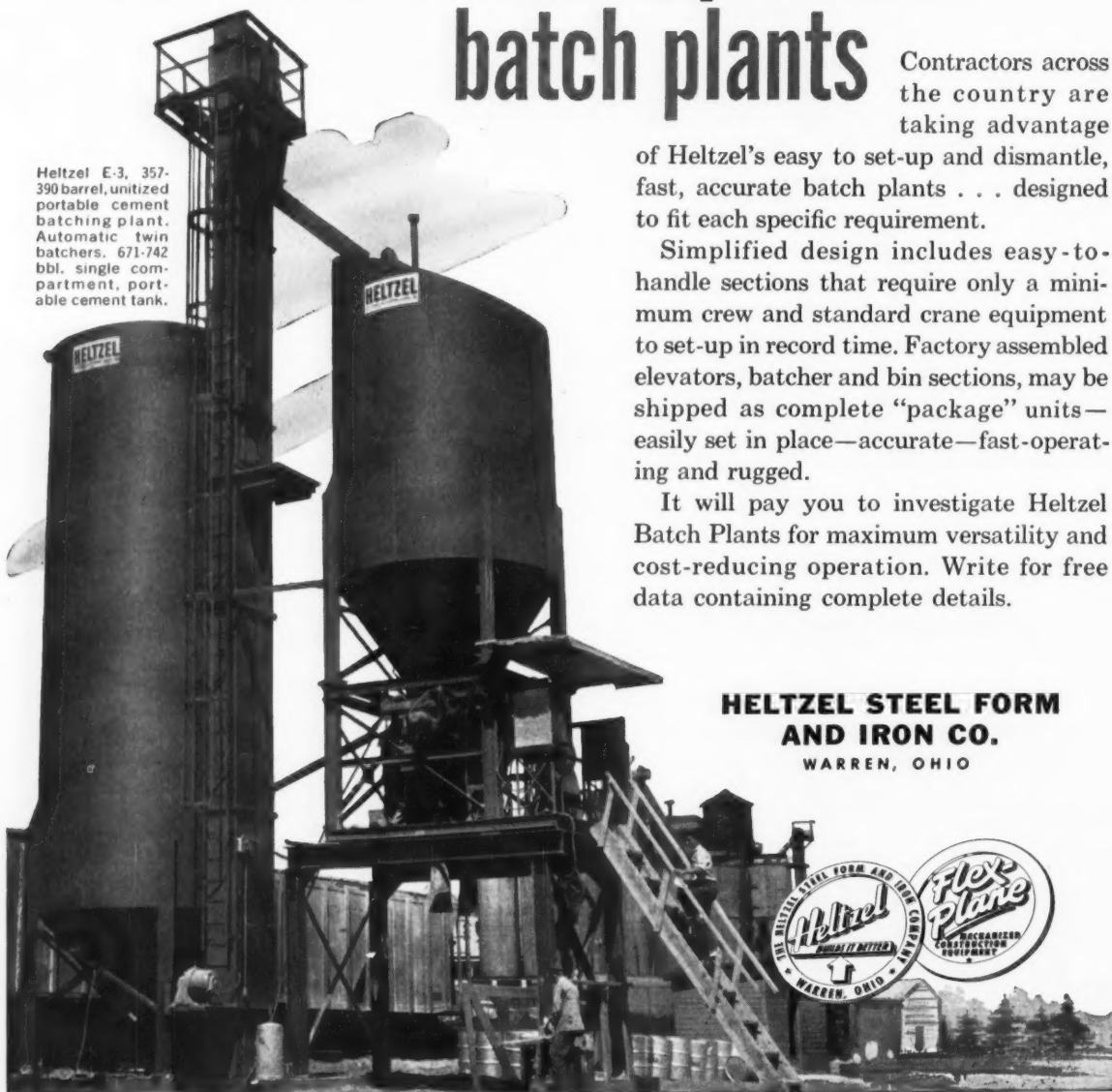
Heltzel 150 ton, 3 compartment, unitized type 200 aggregate bin. Three, 50 ton compartments. Twin, 1½ yard automatic batchers.



**In South Carolina, too . . .**

# the move is to Heltzel's unitized, portable batch plants

Heltzel E-3, 357-390 barrel, unitized portable cement batching plant. Automatic twin batchers. 671-742 bbl. single compartment, portable cement tank.



Contractors across the country are taking advantage

of Heltzel's easy to set-up and dismantle, fast, accurate batch plants . . . designed to fit each specific requirement.

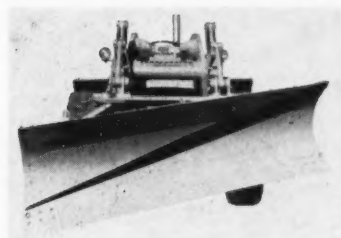
Simplified design includes easy-to-handle sections that require only a minimum crew and standard crane equipment to set-up in record time. Factory assembled elevators, batcher and bin sections, may be shipped as complete "package" units—easily set in place—accurate—fast-operating and rugged.

It will pay you to investigate Heltzel Batch Plants for maximum versatility and cost-reducing operation. Write for free data containing complete details.

**HELTZEL STEEL FORM  
AND IRON CO.**  
WARREN, OHIO



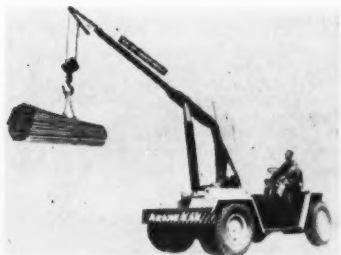




### Dozer Blade For Cat Wheel Loader

A hydraulically controlled dozer blade is now available for the Caterpillar No. 944 Traxcavator (CM&E, March, p. 206). The Balderson BA944 Angledozer attachment mounts on the lift arms in place of the bucket.

The blade is 35 in. high and 10 ft 2 in. long. It can be angled to the right or left at 25 deg to cut a width of 9 ft 2 in. The extension brace folds in behind the blade for straight dozer work. The bucket dump cylinders control the blade pitch.—Balderson Inc., Wamego, Kan.



### Hydraulic Crane

All operating functions of Silent Hoist's Krane Kar are hydraulically controlled. The boom revolves on a ball-bearing turntable and can rotate continuously.

Either a Waukesha or a Continental gasoline engine powers the crane. Both are 6-cyl engines. A choice of transmissions also is available. A manual unit gives the crane four speeds in both forward and reverse, and an Allison power shift transmission has three speeds in each direction.

The Krane Kar is available in two sizes: model FAX has a capacity of 12,000 lb, and model FAY can handle 20,000 lb. Both capacities are at a 6½-ft radius. The larger crane can lift as much as 24,000 lb when equipped with hydraulic outriggers. — Silent Hoist & Crane Co., 841-877 63rd St., Brooklyn 20, N. Y.

*Here's heavy-duty power  
tailored for the machine and  
the job!*



**TAILORED POWER** for the Smith Mixer — made by the T. L. Smith Co., Milwaukee, Wis. — is a V-type, 4-cyl. VF4D Wisconsin Engine. The "Curbilder" — made by The Miller Spreader Corp., Youngstown, Ohio — is powered by a one-cyl. 9.2-hp. Wisconsin.

## WISCONSIN ENGINES

Go Wisconsin, if you want to shave time and cost on your construction jobs. The reason: Every Wisconsin Engine is custom-engineered to fit the machine and the job.

You get field-proved dependability that keeps your men and machines busy around the clock in any season. Every Wisconsin is precision-fitted for smooth-firing power with minimum wear. And extra load-lugging power prevents stalling when the going gets rough.

Air-cooling eliminates dry-ups, freeze-ups, water and anti-freeze. And you don't have to buy, service, and replace radiators, water pumps, fan belts, hoses, and other water-cooling components.

If you want dependable all-weather power and lowest upkeep cost, specify Wisconsin. Sizes from 3 to 56 hp, with electric starting and choice of fuel system. Send for Bulletin S-249. Write to Dept. C-30.



### WISCONSIN MOTOR CORPORATION

MILWAUKEE 46, WISCONSIN

World's Largest Builders of Heavy-Duty Air-Cooled Engines

## GUARANTEED

to prevent concrete from  
dusting or flaking for  
a period up to three years.

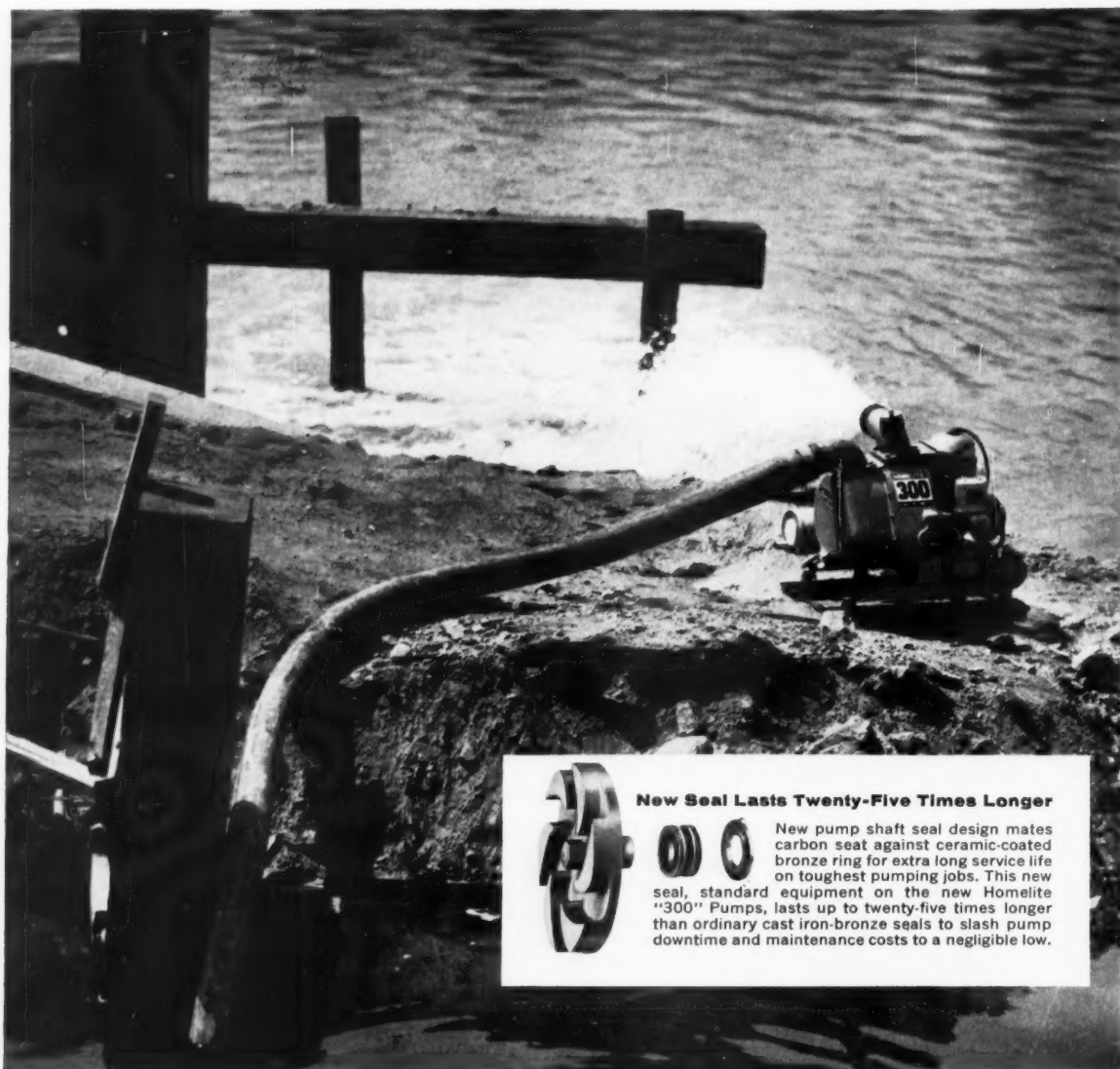
But that's just half the story! One application of TK Treatment seals, cures and hardens concrete. Eliminates the need for wet burlap or any other curing or hardening agent. TK Treatment provides up to 98% moisture retention and protects from rain or temperature changes in just 30 minutes. Think how much time, labor and money you'll save . . . and the profits you'll make. You can't go wrong because TK Treatment is guaranteed.

Get complete details from your TK representative or write to:

**W. F. MACKLIN COMPANY, INC.**

Dept. CM, 336 Taft Street N.E.

Minneapolis 13, Minnesota



#### New Seal Lasts Twenty-Five Times Longer

New pump shaft seal design mates carbon seat against ceramic-coated bronze ring for extra long service life on toughest pumping jobs. This new seal, standard equipment on the new Homelite "300" Pumps, lasts up to twenty-five times longer than ordinary cast iron-bronze seals to slash pump downtime and maintenance costs to a negligible low.

USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

## Get Better Pumping Longer with the NEW HOMELITE "300" PUMPS

Here's the newest and best investment in lightweight, rugged and practical pumping equipment. You get 18,000 gallons per hour capacity. That's 300 gallons per minute. You pump water from ditches, trenches, and other excavations in minutes. Your men get to work faster. And they can stay on the job. Variable throttle control on the new Homelite "300" Pumps keeps excavations workable. Gives you economical seepage control. And their self-cleaning design handles muddy water without clogging.

Light in weight, only 103 pounds, these "300" Pumps are easy to truck and can be carried by one man. They're fast

to get to the job . . . fast to do the job . . . in any location. All are guaranteed to self prime at 28 ft. above water level. They're air-cooled, weatherproof . . . can't freeze or overheat.

Three models are available. The quiet, slow-speed model for economical, high-capacity pumping jobs. The standard-speed model for general use on jobs requiring higher discharge pressures. And the high-volume pressure pump model for jetting, pumping through long discharge hose or piping and other jobs requiring high discharge pressures.

See them in action. Ask for a free on-your-job demonstration.



Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

**HOMELITE**  
CARRYABLE  
**PUMPS** GENERATORS • BLOWERS  
CHAIN SAWS

HOMELITE • A DIVISION OF TEXTRON INC., 1004 RIVERDALE AVE., PORT CHESTER, N. Y.  
In Canada — Terry Machinery Co., Ltd.



### Two New Trucks

One of two new Mack trucks is shorter and weighs less than previous models; the other features improved traction for off-the-road hauling.

The B-462S is a four-wheel-drive truck that carries a 6-yd mixer. The non-driving front axle is rated at 11,000 lb. The capacity of the bogey is 32,000 lb; higher ratings are optional. The truck is equipped with a 20-speed transmission and a traction differential. The driving front axle on the six-wheel-drive B-462SX is rated at 15,000 lb; bogey capacity is the same as on the four-wheel-drive unit.

Wheelbases on both trucks are 170½ in., but longer wheelbases are optional. Standard power plant on both models is a 150-hp Mack engine. A rear engine power take-off drives the mixing drum. — **Mack Trucks, Inc., Plainfield, N. J.**



### Operator's Seat Swivels with Hoe

The redesigned 110 Hopto snap-mount backhoe includes a new type operator's seat and an improved swing mechanism.

The operator now sits over the unit instead of behind it. The seat swivels with the boom and gives the operator good visibility at all times. The improved swing mechanism is more rugged and incorporates double-acting swing cylinders.—**Badger Div., Warner & Swasey Co., Winona, Minn.**

## CONTINENTAL RED SEALS ARE ENGINEERED TO FIT THE JOB

Rarely will you find an item of industrial, construction or road building equipment that won't run best and cheapest on Continental Red Seal power. The reason lies in specialization—in Continental's long-standing policy of engineering each model precisely to the work to be done. Whatever the machine... whatever its job... you can bank on it for abundant power at the speeds consistent with low fuel and upkeep cost.



Continental's ruggedness and rightness of design are helping to build prestige for more and more of the leading builders of specialized power equipment. It's wise when buying equipment of this type, to choose a make with dependable Red Seal power—power backed by specialized experience dating from 1902.

SERVICE AND PARTS  
AVAILABLE EVERYWHERE



**Continental Motors Corporation**

MUSKEGON • MICHIGAN

## CUTTING POWER!



### 14-Inch Holes in 5-10 Minutes!

Hundreds of 14-inch holes and many smaller ones were drilled with Longyear diamond bits through 5-inch terrazzo and reinforced concrete floors to air condition a 32-story office building. Each of the 14-inch holes took only 5-10 minutes of actual drilling time, and every Longyear bit drilled 100-120

holes! Every opening was clean and even, requiring no patch-up, and total cost of this big drilling job was surprisingly low. See your Longyear dealer and find out how the new Longyear industrial diamond drills can knock down your drilling costs.

Adv-167



**E. J. LONGYEAR CO.**

76 S. Eighth Street  
Minneapolis 2, Minnesota  
Phone: Federal 9-7631

Please send complete information on Longyear Diamond Bits and Industrial Drills. Also the name of my nearest Longyear dealer.

NAME \_\_\_\_\_  
FIRM \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
TOWN \_\_\_\_\_ STATE \_\_\_\_\_



**VERSATILE!**

**1 Mobile Drill now does all 4**

- AUGER BORING
- PERCUSSION DRILLING
- SOIL SAMPLING
- CORE DRILLING

*the new, powerful*

## B-52 *pacemaker*

**HYDRAULIC ROTARY DRILL** with the exclusive **Hollow Stem Auger**... lets you sample while you bore!

**ONLY 4-IN-1 RIG ON THE MARKET...**

Mobile Drill's new B-52 PACEMAKER brings you unequalled versatility to meet today's demand for greater drilling speed and flexibility. Here's a rugged, powerful, heavy-weight workhorse that mounts on 1 or 1½ ton vehicles and will drive 5' sectional augers to 150'... N rods to 600'... and A rods to 1000'.

**BIG POWER... BIG PERFORMANCE!**

PACEMAKER's twin hydraulic feed develops 10,000 lbs. hydraulic ram force! Rig has own independent power plant, variable speed control on rotary drive.

**COMPACT... SELF CONTAINED**

Custom mountings are designed to meet your needs, special body fabrications provide storage racks for augers and watertight compartments for tools and accessories... everything to make the PACEMAKER a mobile, fast moving, time saving unit.

**WRITE FOR BULLETIN TODAY!**

For free illustrated folder and complete specifications on the new B-52 PACEMAKER, write

**These Exclusive Mobile Timesavers are Standard Equipment on the Pacemaker**

**1 L-O-N-G 68" STROKE**

—Allows use of 5' auger and soil sampling tools. Lets you make that 5' coring run without a stop to rethuck and pays big dividends in core recovery ratios.

**2 HIGH-TORQUE ROTARY SPEEDS—**

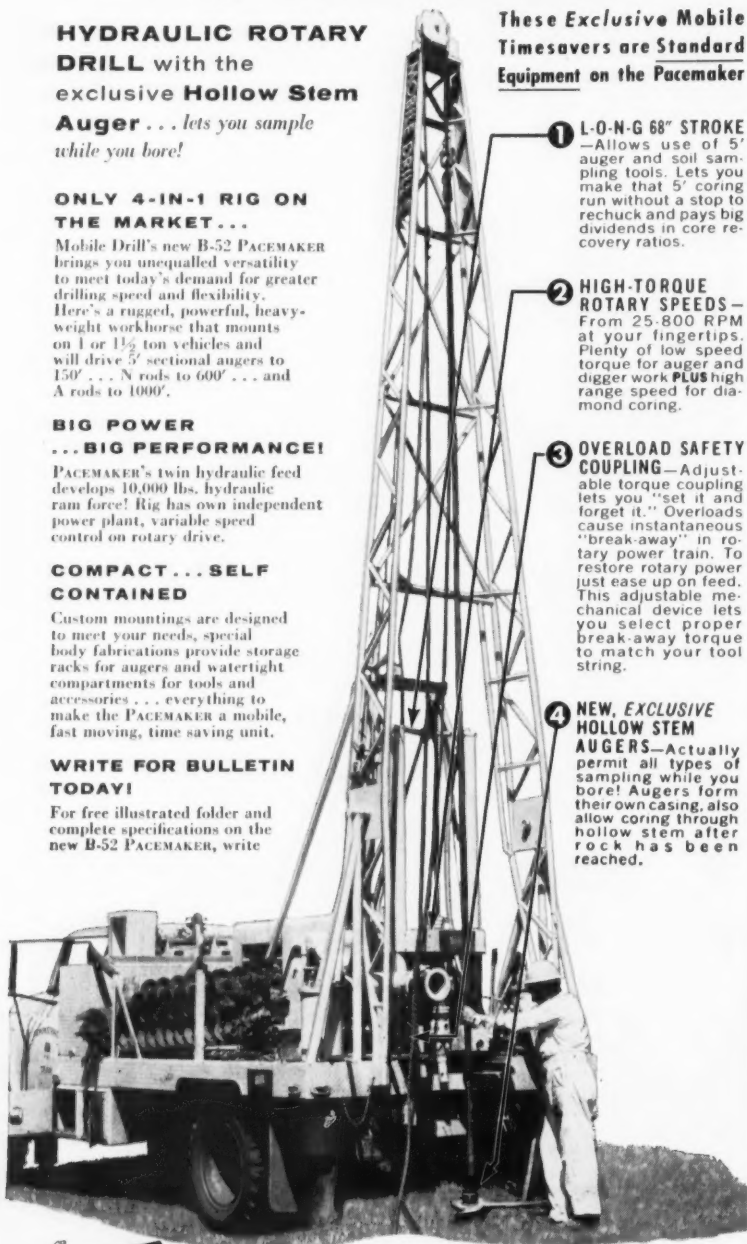
From 25-800 RPM at your fingertips. Plenty of low speed torque for auger and digger work **PLUS** high range speed for diamond coring.

**3 OVERLOAD SAFETY COUPLING—**

Adjustable torque coupling lets you "set it and forget it." Overloads cause instantaneous "break-away" in rotary power train. To restore rotary power just ease up on feed. This adjustable mechanical device lets you select proper break-away torque to match your tool string.

**4 NEW, EXCLUSIVE HOLLOW STEM AUGERS—**

Actually permit all types of sampling while you bore! Augers form their own casing, also allow coring through hollow stem after rock has been reached.

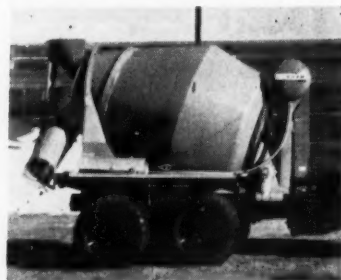


**MOBILE DRILLING, INC.**  
Dept. 18, 960 N. Pennsylvania St.  
Indianapolis 4, Indiana



... From lightweight, jeep-mounted rigs to heavy-duty all purpose drills—MOBILE DRILL CAN MEET YOUR NEEDS! All drills mounted to your specifications.

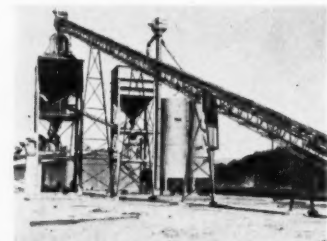
### EQUIPMENT NEWS...continued



#### Concrete Mixers

A line of truck-mounted concrete mixers has been introduced by Dunham, a manufacturer of hydraulic dump bodies.

The Porto-Mix units are available in sizes of 4½ cu yd and larger. Both power take-off and engine-driven models are available.—Dunham Mfg. Co., Minden, La.



#### Sectional Conveyors

Stock conveyor components of various lengths and widths can be combined to make up belt conveyors to suit different job requirements. Rex sectionalized conveyors are available in 24 and 42-in. truss depths to span various distances. The 24-in.-deep trusses are available in 6, 9, and 21-ft lengths. The deeper units come in 16, 20, and 24-ft lengths.—Chain Belt Co., Milwaukee 1, Wis.

#### Fiberglass Tilt-Cabs

Tilt-cabs for a new series of Diamond T tractors and trucks are constructed of lightweight fiberglass. The weight saving is about 350 lb as compared with steel cabs on previous models. The manufacturer also has developed a kit that contains all necessary materials for making repairs.

Gross vehicle weight ratings for the new series range from 22,000 lb to 30,000 lb. The Diamond T engines deliver from 145 to 185 hp.—Diamond T Motor Truck Co., 4401 W. 26th St., Chicago 23, Ill.





ALLIS-CHALMERS

HD

21



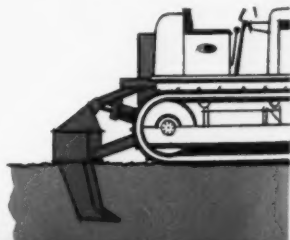
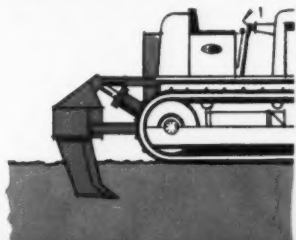
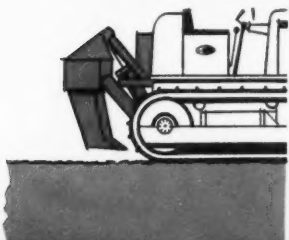
The industry's healthiest engine, coupled to torque converter drive proved through almost 20 years of use, gives the 225-hp Allis-Chalmers HD-21 more work power than any other crawler in its class. In addition, only the HD-21, in its class, is equipped with tapered roller bearings in truck wheels, idlers and rollers to build usable power by reducing friction.

## 225 TURBOCHARGED HP

NET ENGINE HORSEPOWER . . . TORQUE CONVERTER DRIVE



The unique parallelogram design of Allis-Chalmers rippers keeps shanks at the most effective angle . . . up . . . halfway down . . . down full depth. Close-in mounting permits working close to slopes.





Most push loading can be handled by a single Allis-Chalmers HD-21. Its combination of engine efficiency, time-tested torque converter drive and tapered roller bearing truck wheels provides more push than any other crawler of comparable size.

With big motor scrapers in tough cuts, 21's in tandem give you the biggest 450 hp you've ever seen. They will supply all the push power you need, plus the flexibility to split up and build profit . . . dozing . . . ripping . . . and pushing in ordinary conditions.





## WHATEVER YOUR POWER NEED HD-21's PROVIDE IT

**225 turbocharged hp, single**

**450 turbocharged hp, tandem**

For the fraction of a minute in each loading cycle during which extreme power *may* be required, double up your 21's without sacrificing the flexibility of separate units to rip, doze and handle the usual pushing jobs. Even in the tough cuts, you actually need this extraordinary horsepower only during the relatively short "top out" segment of the cutting cycle. If all this power is in a single pusher, much of it is wasted most of the time. With pairs of HD-21's, you have all the push power you need *plus* the flexibility to use it most efficiently.

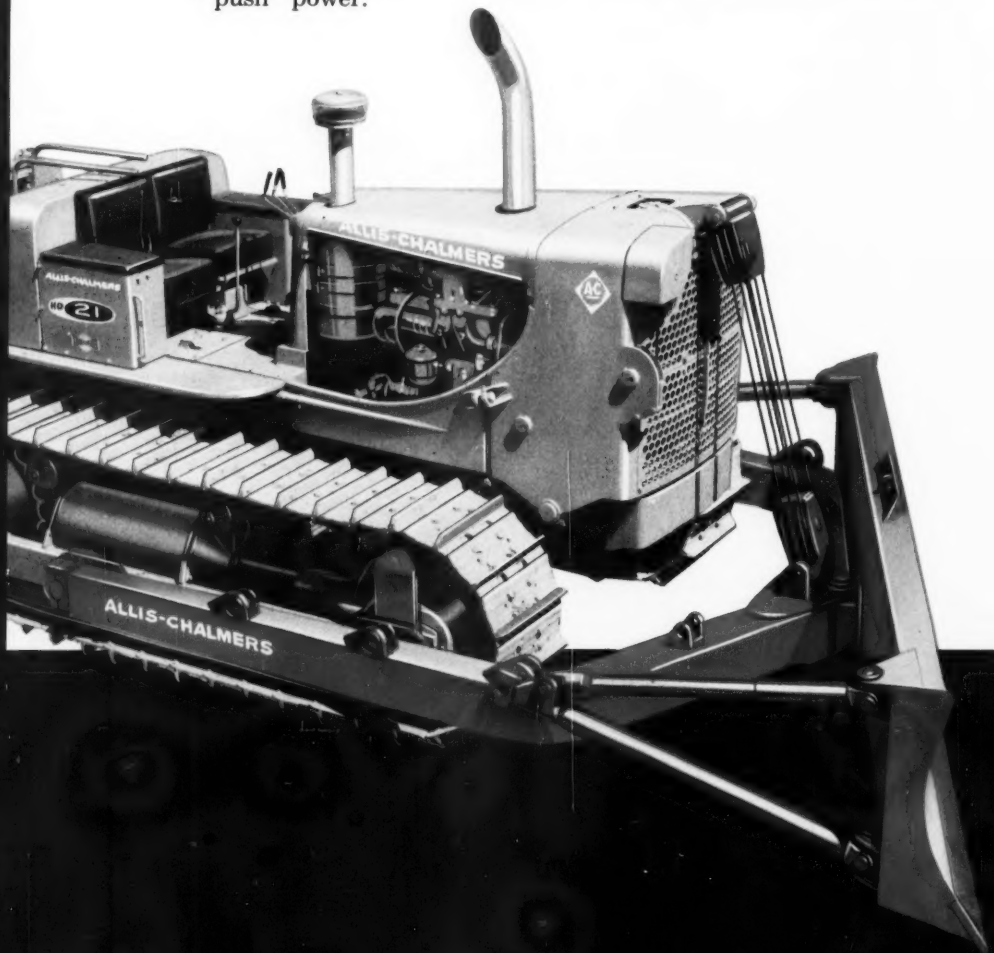


# THE MOST EFFECTIVE RIPPER-DOZER TEAM YOU CAN BUY

Just getting more work power from your HD-21's means more effective *power* for ripping . . . dozing. However, when you add the advantages of Allis-Chalmers ripper and dozer designs, the difference becomes even more discernible . . . more important to your production and profit.

★ ★ ★

Allis-Chalmers dozers are close-mounted to provide excellent tractor-dozzer balance for increased production . . . easier control. High-strength alloy steels, special steel shapes, submerged arc automatic welding and hardened connecting points supply the structural strength to match all of the HD-21's tremendous "push" power.



# THE MOST PROFITABLE SIZE FOR YOUR BIGGEST JOBS

Here's all the power you need to handle the tractor work on your biggest jobs. Singly, the HD-21 will manhandle the vast majority of dozing, ripping, pushing—in tandem they will delight you with the enormous power needed to load your biggest scrapers in tough material.

Whenever conditions permit single pushing, you can use the extra power on other jobs—pioneering, ripping, leveling fills.

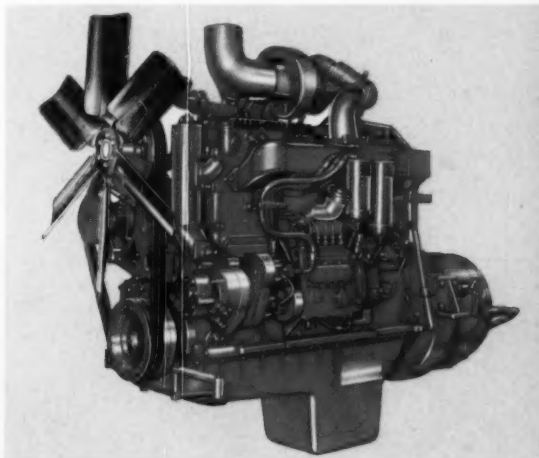
In addition, when maintenance is in order, you don't have to shut down ... one HD-21 will keep your scrapers going while the other is being serviced.

Allis-Chalmers HD-21's are the biggest producers in this most efficient 225 hp class. Here's why:

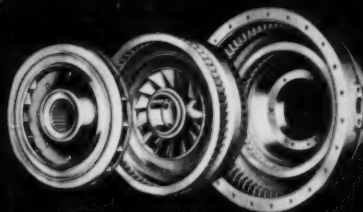
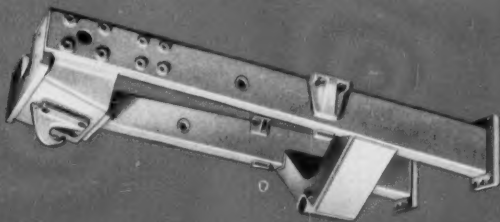
One outstanding example is the performance of the *industry's healthiest* engine coupled to the *best-proved tractor torque converter* to give you maximum power automatically, economically. Almost 20 years of know-how assures you that Allis-Chalmers engines and torque converters are built right to work together with maximum efficiency. In addition, since the HD-21 is the only crawler in its class that rolls on friction-free *tapered roller bearings*, you get more real work power than any other can supply.

**Allis-Chalmers 21000 turbocharged engine**—is rated conservatively at 225 hp at 1825 rpm ... gives you up to 27% better fuel economy than other engines in this class.

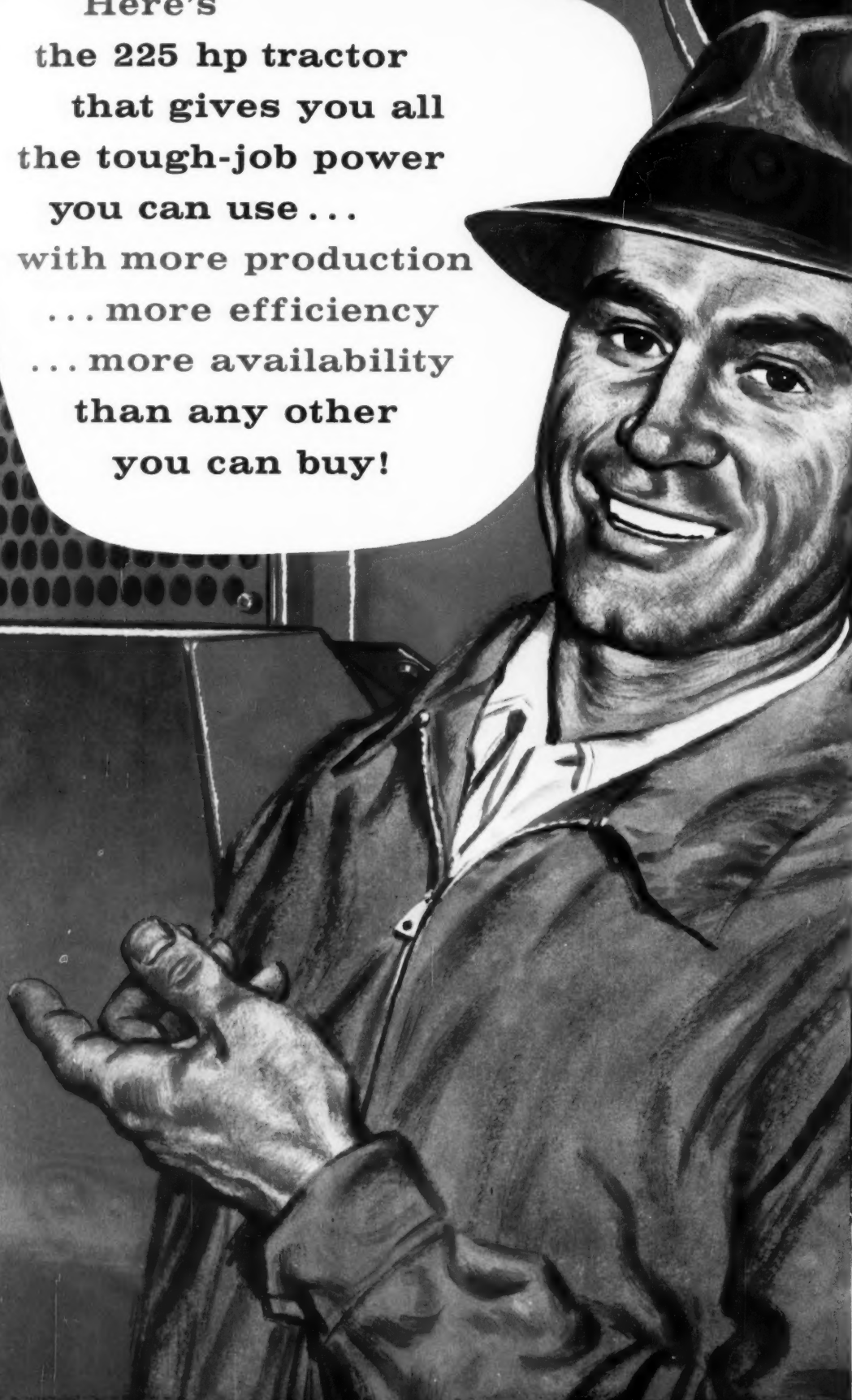
**All-steel main frame**—soaks up vertical, horizontal and twisting strains ... allows more efficient equipment mounting ... permits unit construction of assemblies for faster, easier servicing.



**Torque converter**—hydraulically cushions entire power train ... protects all tractor components and mounted equipment from damaging shock and strain.



**Here's  
the 225 hp tractor  
that gives you all  
the tough-job power  
you can use ...  
with more production  
... more efficiency  
... more availability  
than any other  
you can buy!**



**T**he  
erator  
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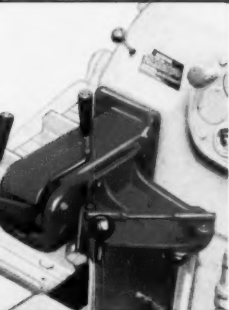
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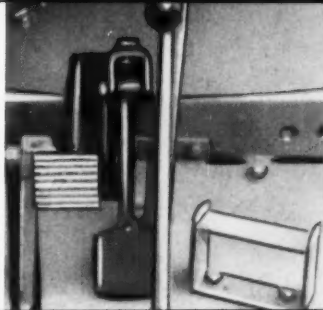


The Allis-Chalmers HD-21 is just what the operator ordered. Big, adjustable foam-rubber seat, console controls, excellent visibility and clean, flat platform help him maintain high production levels with less effort. Torque converter drive eliminates shifting, and *certified* permanent lubrication of truck wheels, idlers and support rollers eliminates unpleasant "nuisance" chore without endangering your investment.

## YOUR MEN WILL LIKE THE 21's EASE OF OPERATION AND MAINTENANCE



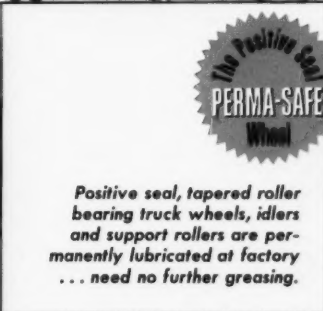
Conveniently grouped console controls take the stretch and pull out of big tractor operation.



Foot decelerator speeds shifting, frees operator's hands for other controls.

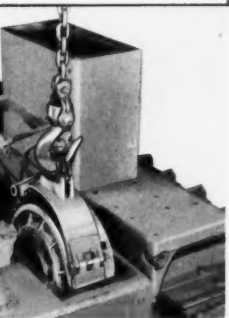


Bucket seat, available optionally, provides extra support, extra comfort for operators.



The Positive Seal  
**PERMA-SAFE**  
Wheel

Positive seal, tapered roller bearing truck wheels, idlers and support rollers are permanently lubricated at factory ... need no further greasing.

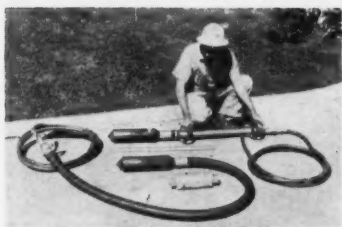


True unit construction allows removal or replacement of any power train assembly without disturbing adjacent assemblies.

Your Allis-Chalmers dealer will show you the HD-21 in action—whenever you say. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

move ahead with **ALLIS-CHALMERS**  
... power for a growing world

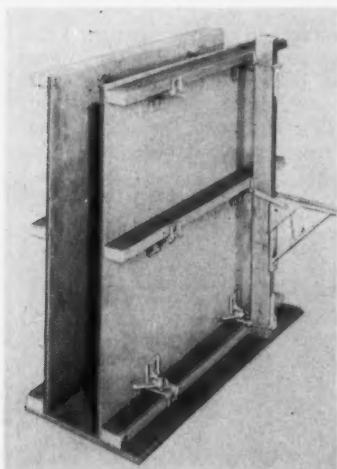




### Big Vibrator Handles Low Slump Concrete

A big air-operated vibrator works at 40,000 vpm; it is designed for one-man operation in low slump concrete with large aggregate. The A-49 Alaskan vibrator is equipped with a three-stage refrigeration system to minimize internal icing of the exhaust. The refrigeration system has no moving parts and requires no maintenance for the life of the vibrator.

The head diameter is 4 3/4 in. Under full load, the Alaskan uses 87 cfm of air at 9,000 rpm and 90 lb throttle. The unit weighs 60 lb. The manufacturer is also offering the A-49 on a per-yard lease basis to contractors.—Dart Mfg. Co., 1002 S. Jason St., Denver 23, Colo.



### Patented Forms

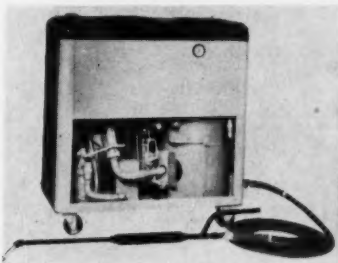
Five different products make up the Gates Cam-Lock system of patented concrete forms. These forms can be used as a separate system or they can be integrated with other Gates systems.

The forms consist of 4x8-ft sheets of plywood and S4S 2x4's or 2x6's; no ribs or hardware is attached to the panels. Either loop-end or button-type Cam-

Lock ties passed through holes or slots in the panels hold the forms in place. Walers may be installed either vertically or horizontally.

Camming pressure produced by a Cam-Lock bracket against the tie holds the 2x4 waler in place. Additional 2x4's or 2x6's can be locked into place with the Stiff-Back cam that connects to the Cam-Lock bracket and works on the same principle as the bracket.

A scaffold bracket developed for this system may be attached to either the Cam-Lock bracket during forming or to tie ends after the concrete is poured and the forms removed.—Gates & Sons, Inc., 80 S. Galapago St., Denver, Colo.



### Compact Steam Cleaner Has Increased Capacity

The Malsbary 130-oil-fired steam cleaner delivers 130 gal of hot solution per hr. This is an increase in capacity of 10 gph over previous models, but the dimensions remain unchanged. Length is 45 in., width 23 in., height 43 in.; the weight is 565 lb. The unit costs \$845.

A caster-mounted model is standard, and tricycle or trailer-mounted units are optional. A gas-fired stationary cleaner is available also. — Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif.

### Aluminum Reduces Truck Mixer Weight

Jaeger has introduced a truck mixer that is supported on an aluminum frame and mounting. The aluminum parts reduce the unit's deadweight by 1,500 to 1,600 lb as compared with previous models of similar capacity.

The truck mixers were developed in cooperation with the Reynolds Metals Co. — Jaeger Machine Co., 800 Dublin Ave., Columbus, Ohio.



## 8 CONTRACTORS PRE-DEWATER WITH FLYGT on BIG SEWER JOB

On a \$23,180,000 sewer bond issue in Orange County, California, 8 separate contractors won their race against time and severe ground water intrusion with Flygt Electric, Submersible Pumps. The 19-mile Miller-Holder Trunk Sewer job experienced water intrusion from the first excavation, and it threatened to slow work to a crawl and run costs to astronomical highs. Key to the final success of the eight separate but simultaneous contracts was efficient, economical pre-dewatering developed jointly by Gridley Equipment Co. and Stanco engineers. Featuring more than 40 Flygt Electric, Submersible Pumps, the pre-dewatering systems drained and kept dry ditches along the right-of-way at substantial savings over other dewatering methods. Typical of contractor comments on the system:



"We are handling all of the water on our job with Flygt Pumps," stated C. B. "Jiggs" Pelland on Steve Rados' \$1,547,860 contract to place 4 miles of 69-inch line. "We turn them on when we shut down for the day and let them run all night without worry. They handle a lot of water and keep the placed pipe water-free."



"Our Flygt Pumps are in continuous operation keeping jacking pits and other excavations dry," remarks George Dakovich on his \$1,363,107 contract to install more than 4 miles of 45- and 51-inch pipe. "We have had dry working conditions from the first at low cost and with little attention."

Flygt Electric, Submersible Pumps range from 1 1/2" 85 gpm to 8" 3100 gpm capacity. Heads to 220' — higher in tandem. Designed and built for tough applications, they are adaptable to any dewatering job. Flygts run continuously with little attention, handle a high degree of solids, need no priming, are easy to handle and service. Ask today for literature and an on-the-job demonstration.



**FLYGT**

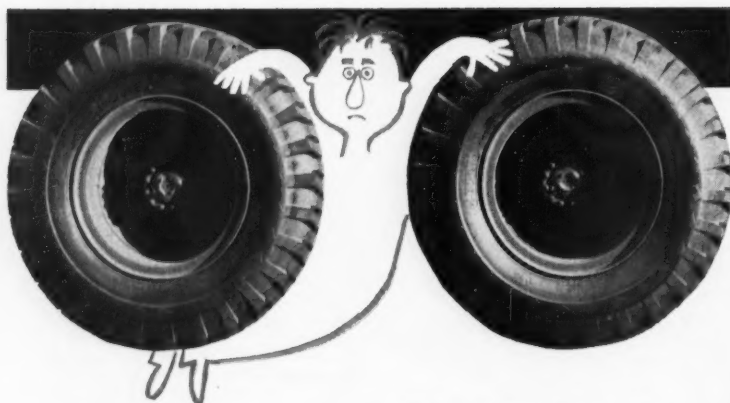
PUMP BETTER ELECTRICALLY  
— USE FLYGT



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More than one million Americans are living  
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helped save many of these lives. Your  
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help discover new cures and, ultimately, the  
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ing cancer in time • Guard your family!  
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### EQUIPMENT NEWS...continued



#### Steel or Aluminum Transit Mixers

A line of transit mixers built by  
Construction Machinery Co. con-  
sists of 24 models available in  
either steel or all-aluminum con-  
struction. Maximum capacity for  
the Transcretes is 7 cu yd.

A new type design gives the  
drum a 40-in. opening to speed  
the discharge of concrete. An au-  
tomatic wash-down system cleans  
the mixer collecting hopper, the  
lip of the charging hopper, rear  
mixer blades, the back edge of  
the drum, and the drip rings. Five  
high pressure spray nozzles op-  
erated by a single valve make up  
the washing system.

All drum operations are con-  
trolled by a single lever from  
either the front or rear of the  
mixer. An optional automatic  
measuring water tank permits the  
operator to set the measuring dial  
and add water while standing on  
the ground. Three drive systems  
are available: separate engine  
drive, flywheel truck engine  
drive, and standard truck engine  
drive.—Construction Machinery  
Co., Waterloo, Iowa.



#### Small Tractor Loader

The 62-hp Oliver OC-9 crawler  
tractor (CM&E, Feb., p. 172) can  
be equipped with a 1-yd bucket  
for loader operations.

The loader's breakout force is  
9,200 lb. Its dumping height is  
96 in.; the reach at dumping  
height is 33 in.—The Oliver Corp.,  
400 W. Madison St., Chicago, Ill.



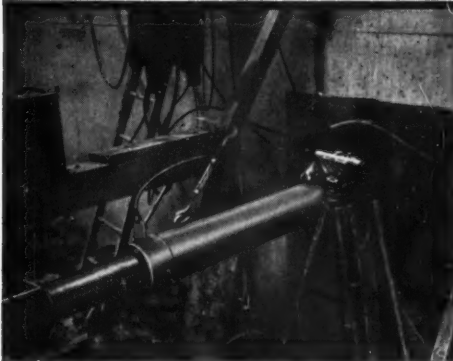
# MUSCLES under the mainline!

## Rodgers Hydraulic Jacks

**push three 88 foot tiles under railroad without disrupting traffic**

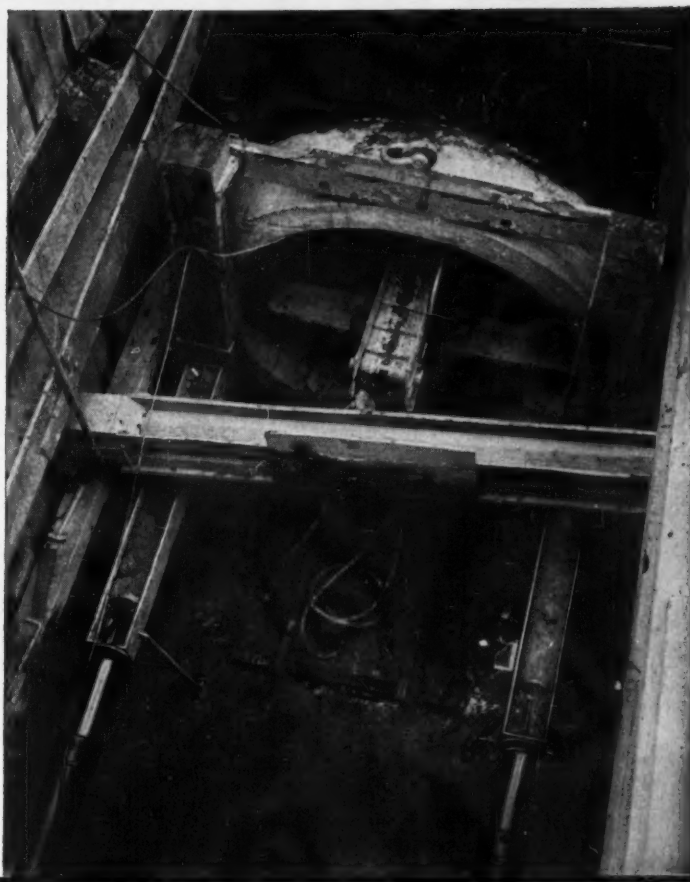
Two 200 Ton Rodgers Hydraulic Jacks were selected by W. J. Irwin & Sons, Inc., Tonawanda, N. Y. for driving three sewer pipes of 96" I. D. reinforced concrete tile 88' under the mainline of the New York Central Railroad. Part of a 2½ million dollar sewer contract on the Tonawanda West Side Drainage Project, the "push pipe" method was preferred because it permitted unrestricted use of the rail right-of-way overhead.

**TIME: 34 DAYS**—Actual jacking time consumed 34 days based on three-eight hour shifts a day. Each sewer took eleven 8-foot tile sections. The *First Line* required 14 days; the *Second Line* 11 days and the *Third* only 9 days.



**JACKING PROCEDURE**—A service pit 28' deep by 22' wide by 40' long was excavated to house the jacking equipment. A pair of 75 lb. steel rails placed on the concrete pit floor cradled the tile sections and acted as a guide for the jacking operation. Type of soil encountered in all three pipes was a mixture of heavy yellow and blue clay.

**EQUIPMENT USED**—Two 200 Ton Rodgers Hydraulic Jacks with 48" ram travel were powered by a Rodgers Model D2 electric driven hydraulic pump located at the top of the excavation pit. A valve panel located at the bottom of the pit permitted accurate control of the jacking operation.



↑ Steel rails cradle tile sections as twin Rodgers Jacking Cylinders press against the wooden jacking frame. Heavy grease on outside of tile cuts down friction—for easier sliding.

← Rear of excavation pit showing Hydraulic Jack against abutment wall. At this stage the ram is extended approximately ⅓ of the 48" ram travel.

**ADVANTAGES OF HYDRAULIC JACKING**—This job was handled at low cost and was unique due to the short time required for completion and the fact that rail service overhead continued uninterrupted throughout the tunneling project below. Entirely different from conventional tunneling, the "push pipe" method also provides greater safety to workers from cave-ins since they work inside the tile that is being driven.

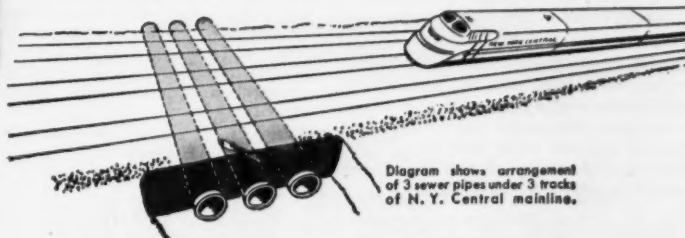


Diagram shows arrangement of 3 sewer pipes under 3 tracks of N. Y. Central mainline.

If you'd like more details about this job, write for free copy of Bulletin 331.

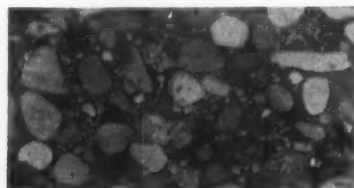
## Rodgers Hydraulic Inc.

7403 Walker St. • Minneapolis 26, Minnesota

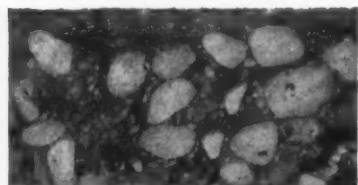


### Dusting Concrete Floors—Causes and Preventions

When a concrete floor dusts it is because the wearing surface is weak and traffic has caused it to become powdery. The wearing surface of a concrete floor is comparatively thin in cross section, and its construction must be controlled by certain basic principles. When properly constructed this top surface will resist extremely severe wear and abrasion indefinitely, and dusting will not occur.



**UNIFORM DISTRIBUTION** of coarse aggregate particles in correctly built concrete floor. Note that aggregate extends right up to wearing surface.

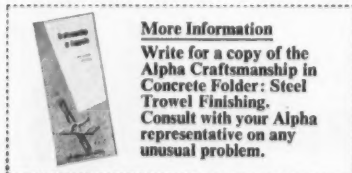


**WEAK WEARING-SURFACE** shows low strength layer of fines. Overtroweling has caused fine particles to rise to the top. Result is excessive shrinkage, cracking and dusting.

#### What Causes Dusting?

Weak surfaces and dusting generally result from the use of overly wet mixes, excessive troweling and/or inadequate curing which allows rapid evaporation of mixing water at the surface.

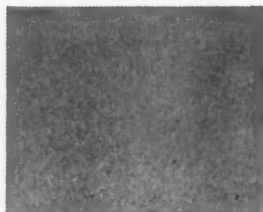
To confirm the fact that these practices actually cause dusting, an experienced finisher was called into the laboratory at one of the Alpha plants. He was asked to construct two slabs using the same concrete mix for each, but the slump, finishing and curing of the two slabs were to be drastically different.



#### More Information

Write for a copy of the Alpha Craftsmanship in Concrete Folder: Steel Trowel Finishing. Consult with your Alpha representative on any unusual problem.

Sample  
A



Curing and finishing of this slab conformed to the recommendations for proper construction that follow. Sample A had a smooth, hard surface which did not dust.

Sample  
B

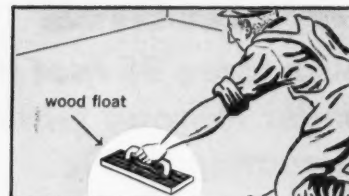


In sample B water was added to increase the slump to 7 inches. It was troweled excessively and not properly cured. Sample B had a soft surface which was easily scratched with a nail as shown in the above illustration.

Since the cement and aggregates for each sample were identical, and each slab subjected to the same weather conditions, this Alpha experiment shows conclusively that the wetter mix, overtroweling and inadequate curing definitely produced the extreme difference in results.

#### How to Build Heavy-Duty Concrete Floors

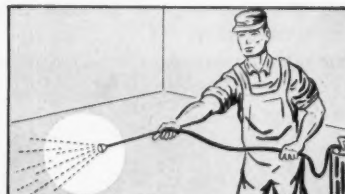
1. Use a relatively dry mix, not over 4-inch slump, on a damp subgrade. For machine floating, water should not exceed 4 gal. per sack of cement; for hand floating not more than 5 gal. per sack of cement.
2. Compact by tamping, rolling or vibrating. If vibration is used, it should be uniformly applied and slump should not exceed one inch.
3. Strike off and wood float to grade immediately. If necessary, use steel trowel sparingly to remove float marks. Avoid excessive troweling!



4. Where an extremely smooth surface is desired, an intermediate troweling may be used with great care immediately after the water sheen leaves the surface.



5. Give final steel troweling when finger pressure just dents the surface. The trowel will then produce a ringing sound. Use enough finishers to handle the concrete when ready.



6. Cure with waterproof paper, membrane curing compounds, wet burlap or by ponding with water. Start curing as soon as possible.

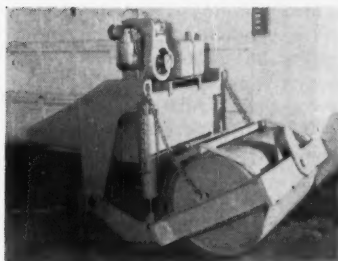
Do not omit any of the above steps. Often small imperfections in fresh concrete surfaces do not show after the concrete is cured; so excessive troweling is unnecessary.

These recommendations are intended for use in finishing horizontal surfaces of non air-entrained concrete. When air-entrained concrete is used, slightly different techniques may be required in steel troweling to prevent pulling or tearing the concrete surface.

# ALPHA

PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.



### Roller Attachment Gets Separate Engine

An independent gasoline engine now powers the GraderollerR attachment for motor graders. The previous model was belt-driven by the grader engine and could be mounted only on Caterpillar motor graders. The independent power plant permits mounting on other graders with only minor grader modifications.

A 7-hp, 1-cyl, air-cooled Wisconsin engine powers the GR-42H GraderollerR. The engine is connected directly to a 6-gpm-capacity hydraulic pump. Hydraulic pressure transfers the grader's weight to the roller producing as much as 225 lb of compaction per lin in.

The 42-in.-wide roller is pivoted at the center and follows the road surface regardless of the grader's position. Remote controls on the grader's platform control the roller.

The GR-42H is equipped with spring tension scraper blades and a 35-gal sprinkler system that starts automatically whenever the roller is lowered into operating position.—Martin Co., 620 Andrews Ave., Kewanee, Ill.

### Vinyl Fasteners

Bolts and nuts made of Geon vinyl, a product of B. F. Goodrich Chemical Co., are available for applications where corrosion is a problem. The fasteners weigh half as much as aluminum and one-sixth as much as steel. Fillister, hexagon, and flat head bolts are available in any standard size.

The vinyl fasteners are suitable for underground applications regardless of soil conditions. The material is inert, weather resistant, non-sparking, non-flammable, and not subject to galvanic action.—Industrial Plastic Fabricators, Inc., Norwood, Mass.

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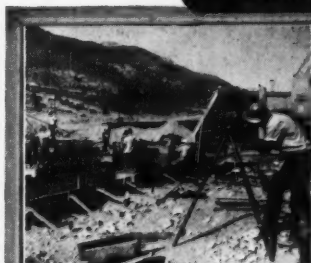
**CHICAGO** provides its laborers with the power to produce. PRIME-MOVER is made specifically for laborers' use—to triple their output in handling of materials. Here is an immediate and positive way to cut costs. Why not do as this alert contractor is doing? Give your laborers the power to produce. Write for job estimating data and performance reports.

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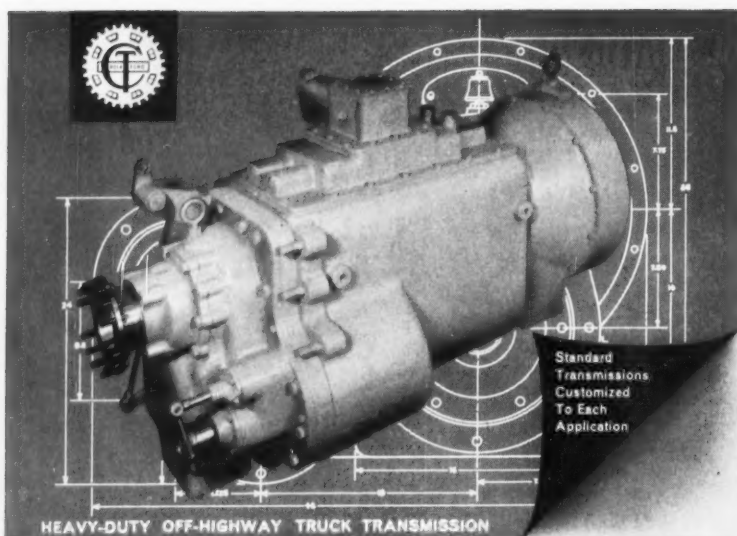


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## Solve your heavy-duty power problems with Cotta heavy-duty transmissions

Is full engine power out of reach for your machine because the gearbox can't handle heavy-duty loads? Cotta power transmission *specialists* can customize standard transmissions to meet your individual heavy machinery requirements: multiple speeds, forward and reverse, space limitations, continuous day-and-night operation, weight, and mounting.

### 150 to 2,500 ft-lb input torque capacities

Cotta takes over where standard transmissions quit . . . in 100 to 750-hp ranges . . . in capacities from 150 to 2,500 ft-lb input torque. For half a century, Cotta "engineered-to-order" transmissions have been leaders of power to profit on drilling rigs, rock crushers, pumps, power shovels, locomotives, generators, and other equipment demanding long hours of trouble-free operation in the field.

### Diagrams sent free on request

See our catalog No. 3A/Co in *Sweet's Product Design File*. Check the detailed descriptions and specifications on standard and custom applications. Then call Cotta (TWX-RK-7720 or phone WO 4-5671) for details on transmissions designed especially to solve your heavy-duty power problem.



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Locomotives



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# COTTA

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COTTA TRANSMISSION CO., ROCKFORD, ILLINOIS

## New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

**WIRE ROPE**—A condensed catalog (6025) lists new weights and strengths of both Monarch Whyte Strand and PREMIUM Whyte Strand wire rope. It includes a description of wire rope construction and information for ordering wire rope.—**Macwhyte Wire Rope Co., Dept. P.R., Kenosha, Wis.**

**TANDEM ROLLERS**—Operating and construction features of Galion's 3 to 5-ton and 4 to 6-ton variable weight tandem rollers are illustrated in bulletin No. 435. The bulletin also describes a hydraulically-operated towing attachment with rubber tires for the 3 to 5-ton roller, and it explains the operation of the retractable wheels for towing the 4 to 6-ton roller. Features of the Roll-O-Matic torque converter drive, compression data, and complete specifications are included.—**Galion Iron Works & Mfg Co., Galion, O.**

**POWER SHOVEL**—Lorain describes its Model L85A 2½-yd power shovel in a 24-p booklet. The power shovel is also available as a crane, clamshell, dragline, and backhoe, all detailed in the booklet. Features of the turntable, controls, and crane boom are included.—**The Thew Shovel Co., Lorain, O.**

**SCRAPERS**—Allis-Chalmers describes two of its scrapers in separate booklets. Catalog MS-1357 covers the 340-hp TS-360 scraper with a 30-yd heaped capacity. The 20-p catalog highlights construction, engineering, and operating features, and includes specifications. An 8-p catalog (MS-1322) covers the 155-hp TS-160 scraper with a 9½-yd heaped capacity.—**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**

**CRUSHING AND SCREENING**—Universal Engineering describes its new Gravel King, a crushing and screening unit capable of producing more than 700 tph, in bul-





Brief unloading time was all the rest allowed Mack tractor before starting the 200-mile return run to the plant for another load. Each Newcrete beam was 30 inches square, 45 feet long and weighed 14 tons.

## Giant bridge beams ride through the Appalachians From Roaring Springs to Shinglehouse

A bridge construction job at Shinglehouse, Pa., called for on-schedule delivery of 60 pre-stressed Newcrete concrete beams—each 45 feet long and weighing 14 tons. From its plant at Roaring Springs, New Enterprise Stone & Lime Co., Inc., sent its B-83 Model Mack six-wheel tractor 200 miles over some of the most rugged mountains in the east with two giant beams at a time. After each delivery, the empty unit hurried back to the plant, reloaded, took on a new driver and started another 200-mile grind to the job site. The Mack tractor took the day-in, day-out pounding of the

30 grueling round-trips in stride—delivering all 60 bridge members right on schedule.

Macks have the stamina to deliver top-capacity loads in record time—day after day, month after month—with minimum upkeep requirements . . . the power that makes light work of steep grades and rough terrain . . . the positive traction—provided by Mack's Balanced Bogie with Power Divider—needed for sure-footed hauling through mud, sand, gravel and snow.

You'll find Macks are favorites on any heavy-duty trucking job because

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FIRST NAME FOR  
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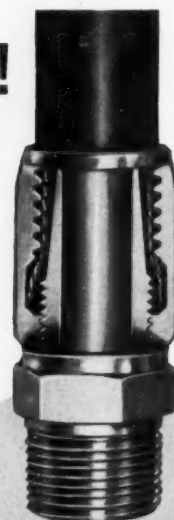
# Reusable and Swaged-On Assemblies!

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Contact your Wholesale Supplier—or write for the following Surgepruf catalogs: No. 40-25, Reusable Coupling and Hose Catalog; No. 40-27, Swaged-on Hose Assemblies Catalog; No. 40-36, Adapters Catalog. Dept. 524, 1850 Diversey Parkway, Chicago 14, Illinois.



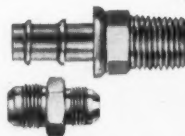
**Only Surgepruf Reusable Couplings and Hose Have These Outstanding Features:**

- Superior Fluid Seal eliminates seepage between coupling shell and wire braid
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- Full Interchangeability—regardless of hose line, Surgepruf couplings are available in any style and thread.

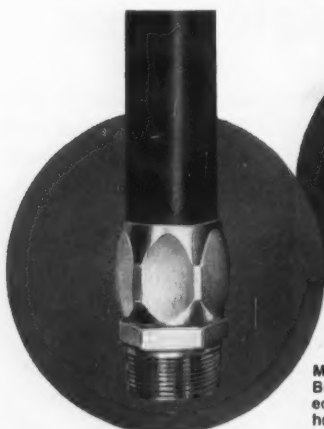


**ALEMITE**  
DIVISION  
**STEWART-WARNER**  
CORPORATION

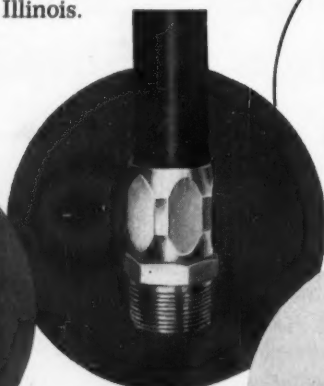
1850 Diversey Parkway, Chicago 14, Illinois



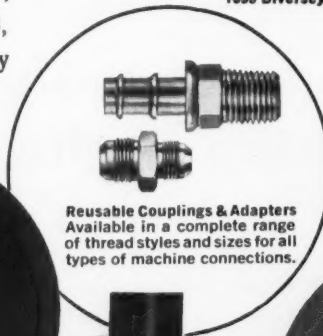
**Reusable Couplings & Adapters**  
Available in a complete range of thread styles and sizes for all types of machine connections.



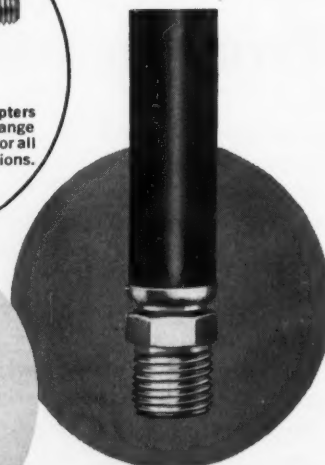
**High Pressure Hose.** Burst and working pressure equivalent to SAE 100R2. In hose ID's from 1/4" to 2".



**Medium High Pressure Hose.** Burst and working pressure equivalent to SAE 100R1. In hose ID's from 3/8" to 1 1/8".



**Medium Pressure Hose.** Complies with SAE 100R3 requirements. In hose ID's from 1/4" to 1".



**Low Pressure Hose.** Burst pressure, 1000 psi.; working pressure, 250 psi. In hose ID's from 1/4" to 3/4".

## NEW PUBLICATIONS...

continued

letin No. 539-A. The bulletin describes the matched jaw crusher and screening mechanism. Copies are available from local distributors. — **Universal Engineering Corp., Cedar Rapids, Iowa.**

**SCREED ATTACHMENT** — A bulletin (SD-125) available from Blaw-Knox describes a screed attachment for concrete paving spreaders that eliminate the need for an extra finisher. The bulletin presents a case history write-up of a highway construction job on which the Model 5M attachment increased production and reduced maintenance. — **Blaw-Knox Co., Construction Equipment Div., Mattoon, Ill.**

**EARTHMOVERS** — A reference catalog presents the complete line of Caterpillar earthmoving equipment and diesel engines. The 20-p booklet is called "Caterpillar Construction Equipment." It contains model views and brief specifications. Copies may be obtained at Caterpillar dealers.—**Caterpillar Tractor Co., Peoria, Ill.**

**TRAILERS**—Details and specifications of Rogers High-Flat trailers, Models HFT-25 and HFT-25T1 are described in a 4-p folder. Construction details, wheel suspension, extensions, and telescoping features, plus full specifications, are included.—**Rogers Bros. Corp., Albion, Pa.**

**PERCUSSION DRILL**—The Joy 450-DR Dual Rotation drill, a percussion rock drill with a 4½-in. bore, is described in an 8-p bulletin. Bulletin 87-J describes how an integral air motor provides hammerless rotation for changing steels and assists rifle bar rotation in tight formations. The bulletin also illustrates the Joy TDM Trac-Drill, a carrier for the 450-DR.—**Joy Manufacturing Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa.**

**CEMENT BATCHER** — Heltzel describes its dustless, dual cement batcher that can increase the capacity of any batch truck plant in bulletin 59-22. The bulletin shows how four-compartment batch trucks can be loaded in only two stops by adding the 32-cu-ft capacity dual batcher to a batch plant.—**Heltzel Steel Form and Iron Co., Warren, O.**

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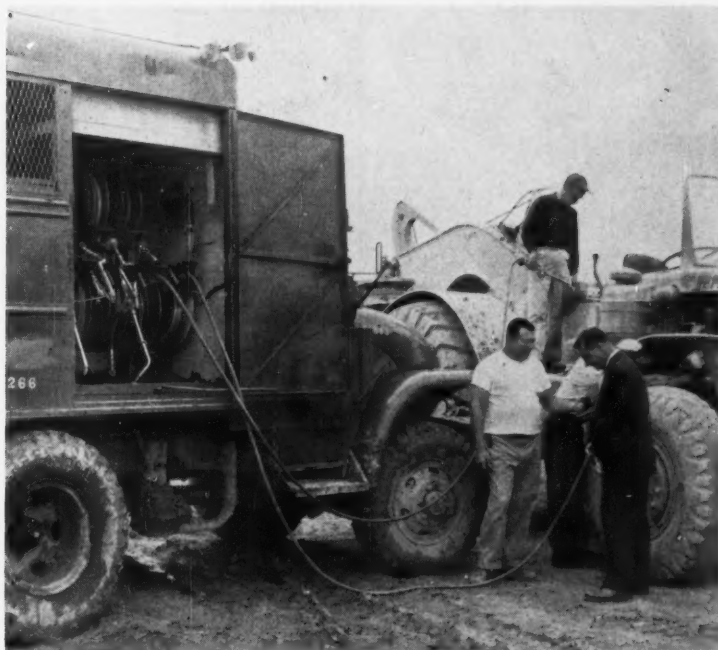


**United States Rubber**

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# Maintenance Shop



**FIELD SERVICE**—Maintenance truck carries supplies for field-servicing machines.

line fuel is not expensive when breakdowns and resulting labor costs are considered." The fuel is given a share of the credit when Replogle can operate equipment with less than 5% downtime for repairs.

## Fuel Storage

The company's machines consume about 3 million gal of diesel fuel per year. To get the fuel as close to the job site as possible, Replogle, in cooperation with Gulf Oil Corp., developed large portable fuel storage and dispensing units. Each of these is a complete field service station that consists of storage tanks, high-volume electrically powered pumps, meters, and filters. The entire assembly is mounted on heavy pipe skids.

In addition, the company has

## Standardization Cuts PM Costs

**PREVENTIVE MAINTENANCE** at the C. F. Replogle Co., an Ohio contractor, is based on the three-fold foundation of instructions, control, and assignment. Master cards for these three functions are kept in the main office in Circleville; their plastic counterparts follow the equipment to Replogle job sites.

Instruction cards tell Replogle employees what look for and what to report. The control cards show each day's operation for a given machine, and the cumulative record indicates when maintenance action is required. Assignment cards go to the mechanics and lube men showing them exactly what to repair or lubricate and when.

### Inspection

Sampling, testing, and inspection are other integral parts of Replogle's maintenance program. Analyzing oil or fuel samples is standard practice. "When you find out what is happening to the oil," says 'Rep' Replogle, "you can

find out what is wrong with the engine. Knowing what is wrong with it will enable you to get the trouble corrected faster and put the machine back to work."

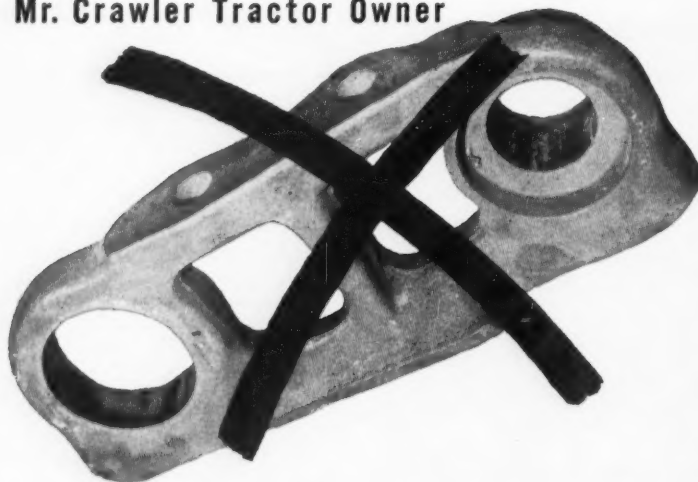
But test data on oil or fuel is not very useful unless some standard of comparison is available. To accomplish this Replogle uses only products of the Gulf Oil Corp. He specifies low sulfur fuel for diesel units, Gulf Super Duty crankcase oil for engines, Gulf Harmony oils for compressors, and Gulf multi-purpose gear lubricant.

In the company's preventive maintenance thinking, it is false economy to use less than the best fuels, oils, and greases. Their operations manager, Charles Thompson, claims they have as little trouble with engines as anyone ever will. He adds: "People tend to look at volume when they think of fuel costs. If they have 30 or 40 engines, fuel is an obvious expense, unlike maintenance costs, which are not obvious. A first-



**SHOP WORK**—Replogle buys only track rails, then installs special pads on them.

## Mr. Crawler Tractor Owner

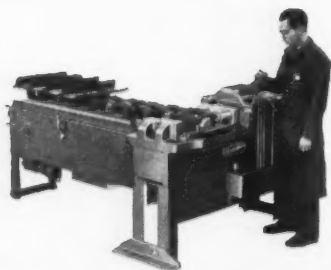


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CORRECTLY, DOES NOT  
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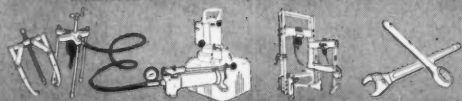
Write for the names of OTC Trackmaster owners in your area and/or more information.



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## MAINTENANCE SHOP . . .

*continued*

assembled special lube trucks that carry fuel and oil to machines in the field. All of these rigs are Army surplus six-wheel-drive 1953 or 1954 GMC trucks. By standardizing on one model, Replogle again looks to cutting costs.

### Oil Analysis

Crankcase oil is another item that gets careful attention. Replogle was the first contractor to buy big MRS tractors and scrapers. These are diesel-powered machines that can haul as much as 50 yd heaped. When the company first got these tractors, oil was changed at less than recommended intervals. Careful sampling and analysis of the Gulf Super Duty crankcase oil showed that the change interval could be extended. Now they are draining the oil at intervals that are longer than those generally recommended for high output diesels.

Other tractors, trucks, and scrapers were analyzed in a similar manner, and the hours of operation between oil changes were increased considerably.

Accurate management of lubrication and parts replacement further reduces downtime. For example, Replogle insists that filters be changed at the proper time. If a filter has to be changed at 300 hours, it must be done on the day when this number of operating hours is reached and no later.

One of the important benefits of a good inspection program is that it gives advance notice of what spare parts to bring to job locations at a given time. Track wear is measured every 120 hours. By determining the average hourly rate of wear, it can be predicted almost to the day, when new tracks will be needed.

But the new tracks are somewhat unusual. Replogle buys just the Cat track rails and then installs his own pads on them. The pads are specially designed in a wavy pattern. The contractor feels that this design gives the tracks more surface and improves traction and lateral support on slopes. Special alloys, heat treating, and work-hardening properties incorporated in the track pads increase their service life substantially.



# **"CLASH-BOX"** robbing your **CASH-BOX?**

*Crawlers without  
full-power shift  
are obsolete . . .  
and costly!*

If your crawlers have master clutches and manual shift transmissions—"clash-boxes" as they're commonly called—you may be passing up profits that should be yours.

With proven Torqmatic Drive in the Model C-6 and the TC-12, Euclid Crawlers provide full-power shift and instant reverse. There's no loss of power or momentum when changing from one speed range to another . . . no delay for clutching and shifting . . . and with a flick of the wrist you change travel direction fast. It's a dependable power train, too . . . proved in thousands of "Euc" earthmovers on every kind of job.

Have your dealer show you how Euclid Crawlers have more productive capacity on any tractor work . . . dozing, ripping, push loading big scrapers, or towing heavy loads. The seconds they save on every work cycle can add up to more cash in your cash box!

**EUCLID** Division of General Motors, Cleveland 17, Ohio  
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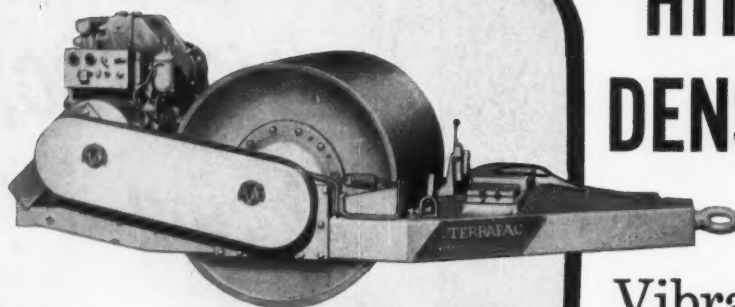


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FOR MOVING EARTH, ROCK, COAL AND ORE



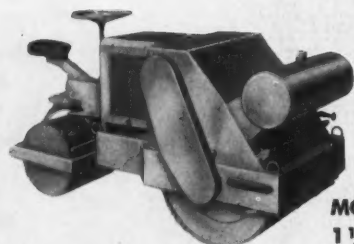
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**9-TON IMPACT**



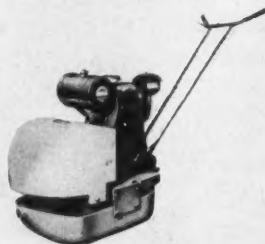
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Get the right unit for your job . . .  
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**ROLLERS • TAMPERS**

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# Methods Memo . . .



## Workmen Dash to Safety

The last bucket of concrete for a 5,200-sq-ft pour had been placed and 20 workmen were screeding the slab when a rumble below warned them to dash off the deck.

Seconds later the formwork collapsed, dumping about 240 tons of fresh concrete from the roof slab of a three-story underground parking garage in Newark, N.J. The weight of the falling concrete carried away a part of the second story slab. The slab two stories below held but cracked in some places.

Architect Frank Grad and Sons of Newark attributed the collapse to "failure of some portion of temporary construction." The general contractor, Terminal Construction Corp. of Wood Ridge, N.J., said only about 2% of the total floor area was effected and work could continue in other areas.

A story about the foundation work for this garage appears on page 131.

## Two New Paving Materials

Dow Chemical Co. plans to market this spring a plastic additive for portland cement mortar that will simplify resurfacing concrete pavements.

And Johns-Manville Corp. is testing asbestos-asphalt paving mixes that the company says wear longer and require less maintenance.

The Dow product is a synthetic liquid latex—called Dow latex 560—that more than doubles the bond strength of mortar. It is added to the mortar and spread over failing concrete pavement in thicknesses of as little as  $\frac{1}{2}$  in.

The Michigan State Highway Department has used the latex mortar to patch a three-span bascule bridge at Cheboygan, Mich., and reports that the mortar has maintained its bond without any failure after two winter exposures.

Mixing and finishing the latex mortar requires no special equipment, but mixing time is critical. Total mixing time must not exceed 5 min., and mixtures should be placed and finished in 30 min.

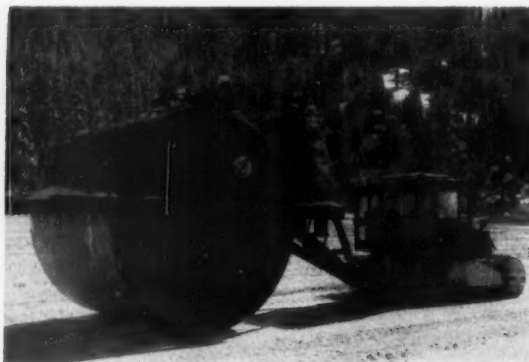
Latex mortar sticks to almost anything so mixing equipment must be washed down immediately after use, and finishing machines must be cleaned frequently during operation.

The latex mix also is more difficult to trowel and screed because of wet drag. It sets rapidly at the surface and forms a skin that will tear if worked too hard.

Johns-Manville says the addition of only 2 to 3% of a special, but common, grade of asbestos fibre to an asphalt mix will "give a tougher road surface with increased resistance to indentation under heavy load and high temperatures, less brittleness under low temperatures, increased flexibility and resiliency, and increased resistance to cracks resulting from exposures to all kinds of weather."

In cooperation with federal, state, and municipal highway agencies, 18 test strips of asbestos-asphalt paving have been laid in eight states and Canada. And some highway officials are conducting independent tests.

Johns-Manville says one advantage of adding asbestos fibre is that it allows the use of more asphalt in the mix. Design of a mix, however, varies according to conditions and materials.



## Building a Snow Pavement

A 5-ton roller, 8 ft in diameter, helped "pave" the parking lot at Squaw Valley, Calif., site of the 1960 Winter Olympics.

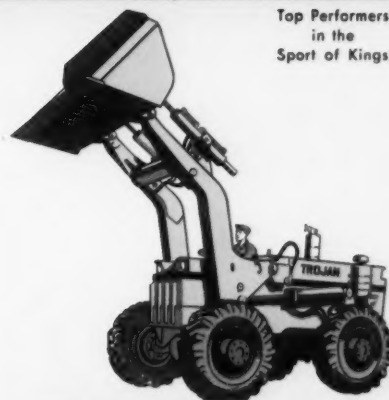
The paving actually was a 2-ft thickness of compacted snow. It covered 125 acres and accommodated as many as 10,000 automobiles a day. "Operation Packdown" was carried out by a Navy Seabee battalion.

When the new snow—either on the ground or on top of old, compacted snow—could be compacted to a depth of about 6 in., the Seabees alternately rolled it and planed it. When the snow was too deep to be compacted that way, they used a Seaman Pulvimixer, modified for snow work, to mix the fine-grained new snow with the compacted snow beneath. Then they covered the surface with a 1-in. layer of sawdust to insulate the compacted snow and provide better traction.



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Weighing in at 2½ million lbs., this giant Bucyrus-Erie wheel excavator knocks out previous records for this type of equipment. It can dig and stack 2,000 yds. of over-burden an hour. And the stacker conveyor belt speed—1,000 fpm—was believed impossible to achieve for this type of service.

To take the extreme loads on the main wheel drive—heart of the machine—Bucyrus-Erie uses three Timken® double row tapered roller bearings. Two more are on the conveyor drive. And 344 Timken bearings roll the loads at other critical points. Timken bearings work better because . . .

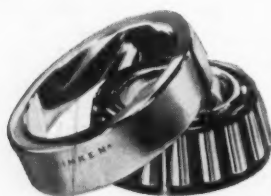
1) *They take all loads.* Their taper lets Timken bearings take all radial and thrust loads. And full-line contact between rollers and races provides extra load-carrying capacity when needed.

2) *They practically eliminate friction, reduce maintenance.* Timken bearings are geometrically designed and pre-

cision-manufactured to roll true. And because they hold shafts concentric with their housings, Timken bearings make closures more effective in keeping lubricant in, dirt out, maintenance down.

Also, you get the *extra* advantages of Timken Company leadership such as service from graduate engineer salesmen qualified to work directly with your purchasing, engineering and production people. Service backed up by advanced research and testing facilities unique in the bearing industry.

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